

Appendix A: Study Team Members

Study Team

| POINT OF CONTACT Name | ORGANIZATION Name Address | Phone Fax E-mail | Role in Project |
|-----------------------------------|---|---|--|
| David Shiver | Bay Area Economics 1285 66 th Street Emeryville, CA 94608 | 510-547-9380 p 510-547-9388 f dshiver@bae1.com | Principal and Co-Principal Investigator; LCCA analysis |
| Cherilyn Widell | Seraph LLC 105 North Water St. Chestertown, MD 21620 | 443-480-2862 m 410-778-3701 p 410-778-3701 f cwidell809@yahoo.com | Principal and Co-Principal Investigator Historic Preservation |
| Rachael Terada Jennifer Martin | Center for Resource Solutions 1012 Torney Ave. 2nd Fl. San Francisco, CA 94129 | 415-561-2100 p 415-561-2105 f rcanapa@resource-solutions.org | Scope 1, 2 & 3 GHG emission estimations; CO ₂ e pricing estimates |
| Douglass C. Reed | Preservation Associates, Inc. 9604 Anderson Road Mercersburg, PA 17236 | 301-730-2699 P Doug@preservationassociatesinc.com | Historic Structure Consultant Cost estimating |
| S. Patrick Sparks, P.E. | Sparks Engineering, Inc. 403 North Mays Street Round Rock, TX 78664 | 512-310-7727 p 512-589-1190 m 512-310-9999 f psparks@sparksengineering.com | Structural and civil engineering |
| Roger L. Catlett, P.E. | Comfort Design, Inc. 620 Pennsylvania Ave. Winchester, VA 22601 | 540-665-2846 p 540-533-0501 m 540-665-0038 f cdi2@comcast.net | Mechanical engineering |
| Paul John Neidinger | Independent practitioner 307 Redwood Street San Antonio, TX 78209 | 210-792-5698 p 210-376-9723 mpneidinger@gmail.com | Architect |

Appendix B:

Scope 3 GHG Emission Calculations

The attached print-out is a representative example of the GHG estimation calculations used for FEW 222-03. For an electronic version, please contact one of the Co-Principal Investigators of this Study listed in Appendix A. This example indicates which GHG calculation tool was utilized for various building assemblies and/or components.

F. E. Warren Building 222-03 Full Modernization with HPS

| Category | Product | Quantity | Unit | kg CO2e per unit | Source | metric tons CO2e |
|--|---|----------|--------------|------------------|---------|------------------|
| SUBSTRUCTURE | | | | | | 84.5 |
| Foundation Wall | Cast-in-place concrete (R-7.5 XPS Continuous insulation) | - | Sq ft | 8.92 | Athena | - |
| | Cast-in-place concrete (R-7.5 EPS Continuous insulation) | - | Sq ft | 8.73 | Athena | - |
| | Concrete block (R-7.5 XPS Continuous insulation) | - | Sq ft | 15.33 | Athena | - |
| | Concrete block (R-7.5 EPS Continuous insulation) | - | Sq ft | 15.14 | Athena | - |
| Foundation Slab | 4" Poured Concrete Slab | - | Sq ft | 4.06 | Athena | - |
| | 6" Poured Concrete Slab | - | Sq ft | 6.09 | Athena | - |
| Footing | Poured Concrete Footing | 156 | Volume (yd3) | 338.61 | Athena | 52.8 |
| Concrete Repairs | | - | | | | - |
| | Epoxy/adhesives for concrete repairs | 26,840 | \$ | 1.18 | EIO-LCA | 31.7 |
| | Concrete leveling | - | \$ | 1.190 | EIO-LCA | - |
| Drainage | Site drains | - | \$ | 0.44 | EIO-LCA | - |
| Waterproofing | Waterproofing | - | \$ | 1.090 | EIO-LCA | - |
| SHELL | | | | | | 452.0 |
| COLUMNS AND BEAMS | | | | | | |
| Average Across All Column and Beam Systems | | - | | 1.72 | Athena | - |
| Assuming Non Load-Bearing Exterior Wall | | | | | | |
| | Concrete column / Concrete beam | - | Sq ft | 7.97 | Athena | - |
| | Concrete column / Glulam beam | - | Sq ft | 3.45 | Athena | - |
| | Concrete column / LVL beam | - | Sq ft | 3.33 | Athena | - |
| | Concrete column / WF beam | - | Sq ft | 5.10 | Athena | - |
| | Glulam column / Glulam beam | - | Sq ft | 0.76 | Athena | - |
| | Glulam column / LVL beam | - | Sq ft | 0.63 | Athena | - |
| | Glulam column / WF beam | - | Sq ft | 2.40 | Athena | - |
| | HSS column / Glulam beam | - | Sq ft | 0.94 | Athena | - |
| | HSS column / LVL beam | - | Sq ft | 0.82 | Athena | - |
| | HSS column / WF beam | - | Sq ft | 2.59 | Athena | - |
| | LVL column / Glulam beam | - | Sq ft | 0.75 | Athena | - |
| | LVL column / LVL beam | - | Sq ft | 0.63 | Athena | - |
| | Softwood column / Glulam beam | - | Sq ft | 0.75 | Athena | - |
| | Softwood column / LVL beam | - | Sq ft | 0.63 | Athena | - |
| | WF column / Glulam beam | - | Sq ft | 0.86 | Athena | - |
| | WF column / LVL beam | - | Sq ft | 0.73 | Athena | - |
| | WF column / WF beam | - | Sq ft | 2.50 | Athena | - |
| | Pre-Engineered Building System Short Span | - | Sq ft | 0.72 | Athena | - |
| | Pre-Engineered Building System Long Span | - | Sq ft | 1.10 | Athena | - |
| Assuming Load-Bearing Exterior wall | | | | | | |
| | Concrete column / Concrete beam | - | Sq ft | 6.12 | Athena | - |
| | Concrete column / Glulam beam | - | Sq ft | 2.42 | Athena | - |
| | Concrete column / LVL beam | - | Sq ft | 2.32 | Athena | - |
| | Concrete column / WF beam | - | Sq ft | 3.77 | Athena | - |
| | Glulam column / Glulam beam | - | Sq ft | 0.61 | Athena | - |
| | Glulam column / LVL beam | - | Sq ft | 0.52 | Athena | - |
| | Glulam column / WF beam | - | Sq ft | 1.96 | Athena | - |
| | HSS column / Glulam beam | - | Sq ft | 0.74 | Athena | - |
| | HSS column / LVL beam | - | Sq ft | 0.64 | Athena | - |
| | HSS column / WF beam | 21,684 | Sq ft | 2.09 | Athena | 45.3 |
| | LVL column / Glulam beam | - | Sq ft | 0.61 | Athena | - |
| | LVL column / LVL beam | - | Sq ft | 0.51 | Athena | - |
| | Softwood column / Glulam beam | - | Sq ft | 0.61 | Athena | - |
| | Softwood column / LVL beam | - | Sq ft | 0.51 | Athena | - |
| | WF column / Glulam beam | - | Sq ft | 0.68 | Athena | - |
| | WF column / LVL beam | - | Sq ft | 0.58 | Athena | - |
| | WF column / WF beam | - | Sq ft | 2.03 | Athena | - |
| | Pre-Engineered Building System Short Span | - | Sq ft | 0.72 | Athena | - |
| | Pre-Engineered Building System Long Span | - | Sq ft | 1.1 | Athena | - |
| Repairs/Maintenance | | | | | | |
| | Metalwork | - | \$ | 1.780 | EIO-LCA | - |
| | Waterproofing | - | \$ | 1.090 | EIO-LCA | - |
| | Grout | - | \$ | 1.190 | EIO-LCA | - |
| INTERMEDIATE FLOORS | | | | | | |
| Average across all intermediate floor assemblies | | - | Sq ft | 4.38 | Athena | - |
| | Glulam (no innter ceiling finish) | - | Sq ft | 1.39 | Athena | - |
| | Precast Hollowcore (no innter ceiling finish) | - | Sq ft | 6.09 | Athena | - |
| | Wood I-joist (no innter ceiling finish) | - | Sq ft | 0.92 | Athena | - |
| | Open-web Steel Joist (no innter ceiling finish) | - | Sq ft | 3.6 | Athena | - |
| | Open-web Steel Joist w/ concrete topping (no innter ceiling finish) | - | Sq ft | 5.58 | Athena | - |
| | Precast Double-T (no innter ceiling finish) | - | Sq ft | 5.16 | Athena | - |
| | Precast Double-T w/ concrete topping (no innter ceiling finish) | - | Sq ft | 7.46 | Athena | - |
| | Steel Joist (no innter ceiling finish) | - | Sq ft | 4 | Athena | - |
| | Steel Joist w/ plywood decking (no innter ceiling finish) | - | Sq ft | 4.21 | Athena | - |
| | Suspended Concrete Slab (no innter ceiling finish) | - | Sq ft | 13.24 | Athena | - |
| | Wood Joist (no innter ceiling finish) | - | Sq ft | 0.75 | Athena | - |
| | Wood Joist w/ plywood decking (no innter ceiling finish) | - | Sq ft | 1.08 | Athena | - |
| | Wood Chord and Steel Web truss (no innter ceiling finish) | - | Sq ft | 2.68 | Athena | - |
| | Wood Truss (no innter ceiling finish) | - | Sq ft | 1.23 | Athena | - |
| | Glulam (gypsum board; latex paint) | - | Sq ft | 1.96 | Athena | - |
| | Precast Hollowcore (gypsum board; latex paint) | - | Sq ft | 6.66 | Athena | - |

F. E. Warren Building 222-03 Full Modernization with HPS

| Category | Product | Quantity | Unit | kg CO2e per unit | Source | metric tons CO2e |
|---|--|----------|-------|------------------|---------|------------------|
| | Wood I-joist (gypsum board; latex paint) | - | Sq ft | 1.48 | Athena | - |
| | Open-web Steel Joist (gypsum board; latex paint) | - | Sq ft | 4.17 | Athena | - |
| | Open-web Steel Joist w/ concrete topping (gypsum board; latex paint) | - | Sq ft | 6.14 | Athena | - |
| | Precast Double-T (gypsum board; latex paint) | - | Sq ft | 5.72 | Athena | - |
| | Precast Double-T w/ concrete topping (gypsum board; latex paint) | - | Sq ft | 8.03 | Athena | - |
| | Steel Joist (gypsum board; latex paint) | - | Sq ft | 4.57 | Athena | - |
| | Steel Joist w/ plywood decking (gypsum board; latex paint) | - | Sq ft | 4.78 | Athena | - |
| | Suspended Concrete Slab (gypsum board; latex paint) | 9,918 | Sq ft | 13.8 | Athena | 136.9 |
| | Wood Joist (gypsum board; latex paint) | - | Sq ft | 1.32 | Athena | - |
| | Wood Joist w/ plywood decking (gypsum board; latex paint) | - | Sq ft | 1.65 | Athena | - |
| | Wood Chord and Steel Web truss (gypsum board; latex paint) | - | Sq ft | 3.25 | Athena | - |
| | Wood Truss (gypsum board; latex paint) | - | Sq ft | 1.79 | Athena | - |
| | Steel decking | - | \$ | 3.11 | EIO-LCA | - |
| Repairs/Maintenance | | | | | | |
| | Concrete leveling | - | \$ | 1.190 | EIO-LCA | - |
| | 4" Poured Concrete Floor | - | Sq ft | 4.06 | Athena | - |
| EXTERIOR WALLS | | | | | | |
| Average across exterior wall assemblies | | - | Sq ft | 13.5 | Athena | - |
| 8" Concrete Block | | - | Sq ft | 22.51 | Athena | - |
| | Brick cladding : Concrete Block : Continuous insulation + Polyethylene membrane | - | Sq ft | 18.75 | Athena | - |
| | Steel Cladding : Concrete Block : Continuous Insulation + Polyethylene Membrane | - | Sq ft | 30.18 | Athena | - |
| | Stucco Cladding : Concrete Block : Continuous Insulation + Polyethylene Membrane | - | Sq ft | 17.65 | Athena | - |
| | EIFS : Concrete Block : Polyethylene Membrane | - | Sq ft | 24.68 | Athena | - |
| | Precast Concrete Cladding : Concrete Block : Continuous Insulation + Polyethylene Membrane | - | Sq ft | 25.38 | Athena | - |
| | Brick Cladding : Concrete Block : Continuous Insulation + Polyethylene Membrane : Gypsum Board + Latex Paint | - | Sq ft | 19.32 | Athena | - |
| | Steel Cladding : Concrete Block : Continuous Insulation + Polyethylene Membrane : Gypsum Board + Latex Paint | - | Sq ft | 30.74 | Athena | - |
| | Stucco Cladding : Concrete Block : Continuous Insulation + Polyethylene Membrane : Gypsum Board + Latex Paint | - | Sq ft | 18.22 | Athena | - |
| | EIFS : Concrete Block : Polyethylene Membrane : Gypsum Board + Latex Paint | - | Sq ft | 25.25 | Athena | - |
| | Precast concrete cladding : Concrete Block : Continuous insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 25.95 | Athena | - |
| | Concrete Block : Continuous insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 16.11 | Athena | - |
| | Concrete Block : Continuous insulation + Polyethylene membrane : 2x4 steel stud wall (16"oc) : Gypsum board + Latex paint | - | Sq ft | 17.9 | Athena | - |
| | 6" Concrete block : 2 coats Latex paint | - | Sq ft | 14.67 | Athena | - |
| 6" Cast-In-Place Concrete | | - | Sq ft | 14.27 | Athena | - |
| | Brick cladding : Cast-in-place-concrete : Continuous insulation + Latex paint | - | Sq ft | 10.51 | Athena | - |
| | Steel cladding : Cast-in-place-concrete : Continuous insulation + Latex paint | - | Sq ft | 21.94 | Athena | - |
| | Stucco cladding : Cast-in-place-concrete : Continuous insulation + Latex paint | - | Sq ft | 9.41 | Athena | - |
| | EIFS : Cast-in-place-concrete : Latex paint | - | Sq ft | 16.44 | Athena | - |
| | Precast concrete cladding : Cast-in-place-concrete : Continuous insulation + Latex paint | - | Sq ft | 17.14 | Athena | - |
| | Brick cladding : Cast-in-place-concrete : Continuous insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 11.08 | Athena | - |
| | Steel cladding : Cast-in-place-concrete : Continuous insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 22.5 | Athena | - |
| | Stucco cladding : Cast-in-place-concrete : Continuous insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 9.98 | Athena | - |
| | EIFS : Cast-in-place-concrete : Gypsum board + Polyethylene membrane + Latex paint | - | Sq ft | 17.71 | Athena | - |
| | Precast concrete cladding : Cast-in-place-concrete : Continuous insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 7.87 | Athena | - |
| | Cast-in-place-concrete : Continuous insulation + Polyethylene membrane : 2x4 steel stud wall (16"oc) : Gypsum board + Latex paint | - | Sq ft | 9.66 | Athena | - |
| 8" Concrete Tilt-Up | | - | Sq ft | 16.01 | Athena | - |
| | Brick cladding : Concrete Tilt-up : Continuous insulation + Polyethylene membrane | - | Sq ft | 12.25 | Athena | - |
| | Steel cladding : Concrete Tilt-up : Continuous insulation + Polyethylene membrane | - | Sq ft | 23.68 | Athena | - |
| | Stucco cladding : Concrete Tilt-up : Continuous insulation + Polyethylene membrane | - | Sq ft | 11.15 | Athena | - |
| | EIFS : Concrete Tilt-up : Polyethylene Membrane | - | Sq ft | 18.18 | Athena | - |
| | Precast Concrete Cladding : Concrete Tilt-up : Continuous Insulation + Polyethylene Membrane | - | Sq ft | 18.88 | Athena | - |
| | Brick Cladding : Concrete Tilt-up : Continuous Insulation + Polyethylene Membrane : Gypsum Board + Latex Paint | - | Sq ft | 12.82 | Athena | - |
| | Steel Cladding : Concrete Tilt-up : Continuous Insulation + Polyethylene Membrane : Gypsum Board + Latex Paint | - | Sq ft | 24.24 | Athena | - |
| | Stucco Cladding : Concrete Block : Continuous Insulation + Polyethylene Membrane : Gypsum Board + Latex Paint | - | Sq ft | 11.72 | Athena | - |
| | EIFS : Concrete Tilt-up : Polyethylene Membrane : Gypsum Board + Latex Paint | - | Sq ft | 18.75 | Athena | - |
| | Precast concrete cladding : Concrete Tilt-up : Continuous insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 19.45 | Athena | - |
| | Concrete Tilt-up : Continuous insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 9.61 | Athena | - |
| | Concrete Tilt-up : Continuous insulation + Polyethylene membrane : 2x4 steel stud wall (16"oc) : Gypsum board + Latex paint | - | Sq ft | 11.4 | Athena | - |
| Insulated Concrete Forms | | - | Sq ft | 15.5 | Athena | - |
| | Brick Cladding : Insulated Concrete Form : Gypsum board + Latex paint | - | Sq ft | 13.36 | Athena | - |
| | Steel cladding : Insulated Concrete Form : Gypsum board + Latex paint | - | Sq ft | 24.78 | Athena | - |
| | Stucco cladding : Insulated Concrete Form : Gypsum board + Latex paint | - | Sq ft | 12.26 | Athena | - |
| | Vinyl cladding : Insulated Concrete Form : Gypsum board + Latex paint | - | Sq ft | 11.86 | Athena | - |
| | Wood cladding : Insulated Concrete Form : Gypsum board + Latex paint | - | Sq ft | 10.75 | Athena | - |
| | Precast concrete cladding : Insulated Concrete Form : Gypsum board + Latex paint | - | Sq ft | 19.99 | Athena | - |
| 2x4 Steel Stud Wall | | - | Sq ft | 9.11 | Athena | - |

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| Category | Product | Quantity | Unit | kg CO2e per unit | Source | metric tons CO2e |
|---|--|----------|-------|------------------|---------|------------------|
| | Brick cladding : R-7.5 Continuous insulation sheathing : 2x4 Steel stud 16" o.c. : R-13 Cavity insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 6.56 | Athena | - |
| | Steel cladding (26 ga.) : R-7.5 Continuous insulation sheathing : 2x4 Steel stud 16" o.c. : R-13 Cavity insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 17.98 | Athena | - |
| | Stucco cladding : R-7.5 Continuous insulation sheathing : 2x4 Steel stud 16" o.c. : R-13 Cavity insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 5.46 | Athena | - |
| | Vinyl cladding : R-7.5 Continuous insulation sheathing : 2x4 Steel stud 16" o.c. : R-13 Cavity insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 5.06 | Athena | - |
| | Wood cladding : R-7.5 Continuous insulation sheathing : 2x4 Steel stud 16" o.c. : R-13 Cavity insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 3.95 | Athena | - |
| | EIFS : Gypboard sheathing : 2x4 Steel stud 16" o.c. : Polyethylene membrane + Gypsum board + Latex paint | - | Sq ft | 13.17 | Athena | - |
| | Precast concrete cladding : : R-7.5 Continuous insulation sheathing : 2x4 Steel stud 16" o.c. : R-13 Cavity insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 13.19 | Athena | - |
| | Brick cladding : R-7.5 Continuous insulation sheathing : 2x4 Steel stud 24" o.c. : R-13 Cavity insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 6.11 | Athena | - |
| | Steel cladding (26 ga.) : R-7.5 Continuous insulation sheathing : 2x4 Steel stud 24" o.c. : R-13 Cavity insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 17.53 | Athena | - |
| | Stucco cladding : R-7.5 Continuous insulation sheathing : 2x4 Steel stud 24" o.c. : R-13 Cavity insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 5.01 | Athena | - |
| | Vinyl cladding : R-7.5 Continuous insulation sheathing : 2x4 Steel stud 24" o.c. : R-13 Cavity insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 4.61 | Athena | - |
| | Wood cladding : R-7.5 Continuous insulation sheathing : 2x4 Steel stud 24" o.c. : R-13 Cavity insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 3.49 | Athena | - |
| | EIFS : Gypboard sheathing : 2x4 Steel stud 24" o.c. : R-13 Cavity insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 12.72 | Athena | - |
| | Precast concrete cladding : R-7.5 Continuous insulation sheathing : 2x4 Steel stud 24" o.c. : R-13 Cavity insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 12.74 | Athena | - |
| 2x6 Wood Stud Wall | | - | Sq ft | 7.14 | Athena | - |
| | Brick cladding : Wood structural panel sheathing : 2x6 Wood Stud 16" o.c. : R-19 Cavity insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 5.12 | Athena | - |
| | Steel cladding (26 ga.) : Wood structural panel sheathing : 2x6 Wood Stud 16" o.c. : R-19 Cavity insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 16.54 | Athena | - |
| | Stucco cladding : Wood structural panel sheathing : 2x6 Wood Stud 16" o.c. : R-19 Cavity insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 4.02 | Athena | - |
| | Vinyl cladding : Wood structural panel sheathing : 2x6 Wood Stud 16" o.c. : R-19 Cavity insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 3.62 | Athena | - |
| | Wood cladding : Wood structural panel sheathing : 2x6 Wood Stud 16" o.c. : R-19 Cavity insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 2.51 | Athena | - |
| | EIFS : Wood structural panel sheathing : 2x6 Wood Stud 16" o.c. : Polyethylene membrane + Gypsum board + Latex paint | - | Sq ft | 11.28 | Athena | - |
| | Brick cladding : Wood structural panel sheathing : 2x6 Wood Stud 24" o.c. : R-19 Cavity insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 5.03 | Athena | - |
| | Steel cladding (26 ga.) : Wood structural panel sheathing : 2x6 Wood Stud 24" o.c. : R-19 Cavity insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 16.46 | Athena | - |
| | Stucco cladding : Wood structural panel sheathing : 2x6 Wood Stud 24" o.c. : R-19 Cavity insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 3.93 | Athena | - |
| | Vinyl cladding : Wood structural panel sheathing : 2x6 Wood Stud 24" o.c. : R-19 Cavity insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 3.53 | Athena | - |
| | Wood cladding : Wood structural panel sheathing : 2x6 Wood Stud 24" o.c. : R-19 Cavity insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 2.42 | Athena | - |
| | EIFS : Wood structural panel sheathing : 2x6 Wood Stud 24" o.c. : Polyethylene membrane + Gypsum board + Latex paint | - | Sq ft | 11.2 | Athena | - |
| Structural Insulated Panel (SIP) | | - | Sq ft | 8.5 | Athena | - |
| | Brick cladding + Builders' paper : 5.5" Structural Insulated Panel : Gypsum board + latex paint | - | Sq ft | 7.25 | Athena | - |
| | Steel cladding + Builders' paper : 5.5" Structural Insulated Panel : Gypsum board + latex paint | - | Sq ft | 18.68 | Athena | - |
| | Stucco cladding + Builders' paper : 5.5" Structural Insulated Panel : Gypsum board + latex paint | - | Sq ft | 6.16 | Athena | - |
| | Vinyl cladding + Builders' paper : 5.5" Structural Insulated Panel : Gypsum board + latex paint | - | Sq ft | 5.76 | Athena | - |
| | Wood cladding + Builders' paper : 5.5" Structural Insulated Panel : Gypsum board + latex paint | - | Sq ft | 4.64 | Athena | - |
| Curtainwall | | - | Sq ft | 14.68 | Athena | - |
| | Curtainwall - Opaque Glazing (with insulated backpan) | - | Sq ft | 18.5 | Athena | - |
| | Curtainwall - Metal Spandrel Panel (with insulated backpan) | - | Sq ft | 10.87 | Athena | - |
| Pre-Engineered Building System | | - | Sq ft | 14.48 | Athena | - |
| | Single skin metal wall panel : Fiberglass insulation | - | Sq ft | 14.48 | Athena | - |
| Wall Strengthening | | - | \$ | 1.700 | EIO-LCA | - |
| | Wall strengthening - Kevlar | - | \$ | 1.700 | EIO-LCA | - |
| Façade | Clay brick (4") unpainted | - | Sq ft | 3.16 | Athena | - |
| Repairs/Maintenance | | - | \$ | | | - |
| | Brick and stonework repair (mortar) | 21,514 | \$ | 1.19 | EIO-LCA | 25.6 |
| | Brick and stonework repair (anchors) | 22,500 | \$ | 0.602 | EIO-LCA | 13.5 |
| | Paint | 1,728 | \$ | 0.988 | EIO-LCA | 1.7 |
| | Woodwork, repairs | 24,660 | \$ | 0.558 | EIO-LCA | 13.8 |
| | Steel studs | - | \$ | 3.110 | EIO-LCA | - |
| | Epoxy/adhesives for concrete repairs | - | \$ | 1.180 | EIO-LCA | - |
| | Insulation - polystyrene | 7,258 | \$ | 1.150 | EIO-LCA | 8.3 |
| WINDOWS AND DOORS | | | | | | |
| Average across all windows | | - | Sq ft | 49.63 | Athena | - |

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| Category | Product | Quantity | Unit | kg CO2e per unit | Source | metric tons CO2e |
|--|--|----------|-------|------------------|---------|------------------|
| Window Frame Type (All windows assume double-pane, Low-E, Argon-filled glazing). | | - | | | | - |
| | Aluminium | - | Sq ft | 86.23 | Athena | - |
| | Vinyl-clad wood | - | Sq ft | 40.07 | Athena | - |
| | Vinyl | - | Sq ft | 41.21 | Athena | - |
| | Wood | - | Sq ft | 50.67 | Athena | - |
| | Curtainwall viewable glazing | 3,107 | Sq ft | 29.97 | Athena | 93.1 |
| | Wood shutters | - | \$ | 0.558 | EIO-LCA | - |
| Door types | | - | | | | - |
| | Wood | - | \$ | 0.558 | EIO-LCA | - |
| | Steel | - | \$ | 0.735 | EIO-LCA | - |
| Awnings | | - | | | | - |
| | Awnings | - | \$ | 0.550 | EIO-LCA | - |
| ROOFS | | | | | | |
| Average across all roof types | | - | Sq ft | 11.21 | Athena | - |
| Precast Hollow-core Concrete | | - | Sq ft | 14.15 | Athena | - |
| | EPDM membrane : R-20 Continuous insulation + Polyethylene membrane : Precast hollow-core concrete : Latex paint | - | Sq ft | 9.63 | Athena | - |
| | PVC membrane : R-20 Continuous insulation + Polyethylene membrane : Precast hollow-core concrete : Latex paint | - | Sq ft | 14.01 | Athena | - |
| | Modified bitumen membrane : R-20 Continuous insulation + Polyethylene membrane : Precast hollow-core concrete : Latex paint | - | Sq ft | 14.49 | Athena | - |
| | 4-ply built-up roofing system : R-20 Continuous insulation + Polyethylene membrane : Precast hollow-core concrete : Latex paint | - | Sq ft | 23.44 | Athena | - |
| | Steel roofing system : R-20 Continuous insulation + Polyethylene membrane : Precast hollow-core concrete : Latex paint | - | Sq ft | 9.18 | Athena | - |
| Precast Concrete Double-T | | - | Sq ft | 12.42 | Athena | - |
| | EPDM membrane : R-20 Continuous insulation + Polyethylene membrane : Precast double-T : Latex paint | - | Sq ft | 7.9 | Athena | - |
| | PVC membrane : R-20 Continuous insulation + Polyethylene membrane : Precast double-T : Latex paint | - | Sq ft | 12.27 | Athena | - |
| | Modified bitumen membrane : R-20 Continuous insulation + Polyethylene membrane : Precast double-T : Latex paint | - | Sq ft | 12.76 | Athena | - |
| | 4-ply built-up roofing system : R-20 Continuous insulation + Polyethylene membrane : Precast double-T : Latex paint | - | Sq ft | 21.71 | Athena | - |
| | Steel roofing system : R-20 Continuous insulation + Polyethylene membrane : Precast double-T : Latex paint | - | Sq ft | 7.45 | Athena | - |
| Suspended Concrete Slab | | - | Sq ft | 21.45 | Athena | - |
| | EPDM membrane : R-20 Continuous insulation + Polyethylene membrane : Suspended concrete slab : Latex paint | - | Sq ft | 16.93 | Athena | - |
| | PVC membrane : R-20 Continuous insulation + Polyethylene membrane : Suspended concrete slab : Latex paint | - | Sq ft | 21.3 | Athena | - |
| | Modified bitumen membrane : R-20 Continuous insulation + Polyethylene membrane : Suspended concrete slab : Latex paint | - | Sq ft | 21.79 | Athena | - |
| | 4-ply built-up roofing system : R-20 Continuous insulation + Polyethylene membrane : Suspended concrete slab : Latex paint | - | Sq ft | 30.73 | Athena | - |
| | Steel roofing system : R-20 Continuous insulation + Polyethylene membrane : Suspended concrete slab : Latex paint | - | Sq ft | 16.48 | Athena | - |
| Open-web Steel Joist | | - | Sq ft | 10.33 | Athena | - |
| | EPDM membrane : R-20 Continuous insulation + Polyethylene membrane : Open-web steel joist w/ steel decking : Gypsum board + Latex paint | - | Sq ft | 6.93 | Athena | - |
| | PVC membrane : R-20 Continuous insulation + Polyethylene membrane : Open-web steel joist w/ steel decking : Gypsum board + Latex paint | - | Sq ft | 11.31 | Athena | - |
| | Modified bitumen membrane : R-20 Continuous insulation + Polyethylene membrane : Open-web steel joist w/ steel decking : Gypsum board + Latex paint | - | Sq ft | 11.8 | Athena | - |
| | 4-ply built-up roofing system : R-20 Continuous insulation + Polyethylene membrane : Open-web steel joist w/ steel decking : Gypsum board + Latex paint | - | Sq ft | 20.74 | Athena | - |
| | Steel roofing system : R-20 Continuous insulation + Polyethylene membrane : Open-web steel joist w/ steel decking : Gypsum board + Latex paint | - | Sq ft | 6.48 | Athena | - |
| | EPDM membrane : R-20 Continuous insulation + Polyethylene membrane : Open-web steel joist w/ wood decking : Gypsum board + Latex paint | - | Sq ft | 4.69 | Athena | - |
| | PVC membrane : R-20 Continuous insulation + Polyethylene membrane : Open-web steel joist w/ wood decking : Gypsum board + Latex paint | - | Sq ft | 9.06 | Athena | - |
| | Modified bitumen membrane : R-20 Continuous insulation + Polyethylene membrane : Open-web steel joist w/ wood decking : Gypsum board + Latex paint | - | Sq ft | 9.55 | Athena | - |
| | 4-ply built-up roofing system : R-20 Continuous insulation + Polyethylene membrane : Open-web steel joist w/ wood decking : Gypsum board + Latex paint | - | Sq ft | 18.49 | Athena | - |
| | Steel roofing system : R-20 Continuous insulation + Polyethylene membrane : Open-web steel joist w/ wood decking : Gypsum board + Latex paint | - | Sq ft | 4.24 | Athena | - |
| Glulam Joist with Plank Decking | | - | Sq ft | 9.53 | Athena | - |
| | EPDM membrane : R-20 Continuous insulation + Polyethylene membrane : Glulam joist w/ plank decking : Gypsum board + Latex paint | - | Sq ft | 5.01 | Athena | - |
| | PVC membrane : R-20 Continuous insulation + Polyethylene membrane : Glulam joist w/ plank decking : Gypsum board + Latex paint | - | Sq ft | 9.39 | Athena | - |
| | Modified bitumen membrane : R-20 Continuous insulation + Polyethylene membrane : Glulam joist w/ plank decking : Gypsum board + Latex paint | - | Sq ft | 9.88 | Athena | - |
| | 4-ply built-up roofing system : R-20 Continuous insulation + Polyethylene membrane : Glulam joist w/ plank decking : Gypsum board + Latex paint | - | Sq ft | 18.82 | Athena | - |

F. E. Warren Building 222-03 Full Modernization with HPS

| Category | Product | Quantity | Unit | kg CO2e per unit | Source | metric tons CO2e |
|--|---|----------|-------|------------------|---------|------------------|
| Wood I-joint with WSP Decking | Steel roofing system : R-20 Continuous insulation + Polyethylene membrane : Glulam joist w/ plank decking : Gypsum board + Latex paint | - | Sq ft | 4.56 | Athena | - |
| | EPDM membrane : R-20 Continuous insulation + Polyethylene membrane : Wood I-joint w/ wood decking : Gypsum board + Latex paint | - | Sq ft | 9.1 | Athena | - |
| | PVC membrane : R-20 Continuous insulation + Polyethylene membrane : Wood I-joint w/ wood decking : Gypsum board + Latex paint | - | Sq ft | 4.58 | Athena | - |
| | Modified bitumen membrane : R-20 Continuous insulation + Polyethylene membrane : Wood I-joint w/ wood decking : Gypsum board + Latex paint | - | Sq ft | 8.96 | Athena | - |
| | 4-ply built-up roofing system : R-20 Continuous insulation + Polyethylene membrane : Wood I-joint w/ wood decking : Gypsum board + Latex paint | - | Sq ft | 9.44 | Athena | - |
| | Steel roofing system : R-20 Continuous insulation + Polyethylene membrane : Wood I-joint w/ wood decking : Gypsum board + Latex paint | - | Sq ft | 18.39 | Athena | - |
| Solid Wood Joist with WSP Decking | Steel roofing system : R-20 Continuous insulation + Polyethylene membrane : Wood I-joint w/ wood decking : Gypsum board + Latex paint | - | Sq ft | 4.13 | Athena | - |
| | EPDM membrane : R-20 Continuous insulation + Polyethylene membrane : Wood joist w/ wood decking : Gypsum board + Latex paint | - | Sq ft | 9.22 | Athena | - |
| | PVC membrane : R-20 Continuous insulation + Polyethylene membrane : Wood joist w/ wood decking : Gypsum board + Latex paint | - | Sq ft | 4.7 | Athena | - |
| | Modified bitumen membrane : R-20 Continuous insulation + Polyethylene membrane : Wood joist w/ wood decking : Gypsum board + Latex paint | - | Sq ft | 9.08 | Athena | - |
| | 4-ply built-up roofing system : R-20 Continuous insulation + Polyethylene membrane : Wood joist w/ wood decking : Gypsum board + Latex paint | - | Sq ft | 9.57 | Athena | - |
| | Steel roofing system : R-20 Continuous insulation + Polyethylene membrane : Wood joist w/ wood decking : Gypsum board + Latex paint | - | Sq ft | 18.51 | Athena | - |
| Wood Chord/Steel Web Truss with WSP Decking | Steel roofing system : R-20 Continuous insulation + Polyethylene membrane : Wood joist w/ wood decking : Gypsum board + Latex paint | - | Sq ft | 4.26 | Athena | - |
| | EPDM membrane : R-20 Continuous insulation + Polyethylene membrane : Wood chord/Steel web truss w/ wood decking : Gypsum board + Latex paint | - | Sq ft | 10.91 | Athena | - |
| | PVC membrane : R-20 Continuous insulation + Polyethylene membrane : Wood chord/Steel web truss w/ wood decking : Gypsum board + Latex paint | - | Sq ft | 6.39 | Athena | - |
| | Modified bitumen membrane : R-20 Continuous insulation + Polyethylene membrane : Wood chord/Steel web truss w/ wood decking : Gypsum board + Latex paint | - | Sq ft | 10.77 | Athena | - |
| | 4-ply built-up roofing system : R-20 Continuous insulation + Polyethylene membrane : Wood chord/Steel web truss w/ wood decking : Gypsum board + Latex paint | - | Sq ft | 11.25 | Athena | - |
| | Steel roofing system : R-20 Continuous insulation + Polyethylene membrane : Wood chord/Steel web truss w/ wood decking : Gypsum board + Latex paint | - | Sq ft | 20.2 | Athena | - |
| Wood Truss (Flat) with WSP Decking | Steel roofing system : R-20 Continuous insulation + Polyethylene membrane : Wood chord/Steel web truss w/ wood decking : Gypsum board + Latex paint | - | Sq ft | 5.94 | Athena | - |
| | EPDM membrane : R-20 Continuous insulation + Polyethylene membrane : Flat wood truss w/ wood decking : Gypsum board + Latex paint | - | Sq ft | 9.38 | Athena | - |
| | PVC membrane : R-20 Continuous insulation + Polyethylene membrane : Flat wood truss w/ wood decking : Gypsum board + Latex paint | - | Sq ft | 4.86 | Athena | - |
| | Modified bitumen membrane : R-20 Continuous insulation + Polyethylene membrane : Flat wood truss w/ wood decking : Gypsum board + Latex paint | - | Sq ft | 9.24 | Athena | - |
| | 4-ply built-up roofing system : R-20 Continuous insulation + Polyethylene membrane : Flat wood truss w/ wood decking : Gypsum board + Latex paint | - | Sq ft | 9.72 | Athena | - |
| | Steel roofing system : R-20 Continuous insulation + Polyethylene membrane : Flat wood truss w/ wood decking : Gypsum board + Latex paint | - | Sq ft | 18.67 | Athena | - |
| Wood Truss (4:12 Pitch) with WSP Decking | Steel roofing system : R-20 Continuous insulation + Polyethylene membrane : Flat wood truss w/ wood decking : Gypsum board + Latex paint | - | Sq ft | 4.41 | Athena | - |
| | 30-yr. fiberglass shingles : Pitched wood truss w/ wood decking : R-20 Cavity insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 5.07 | Athena | - |
| | 30-yr. organic shingles : Pitched wood truss w/ wood decking : R-20 Cavity insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 3.54 | Athena | - |
| | Clay tile roof : Pitched wood truss w/ wood decking : R-20 Cavity insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 3.8 | Athena | - |
| | Steel roof : Pitched wood truss w/ wood decking : R-20 Cavity insulation + Polyethylene membrane : Gypsum board + Latex paint | - | Sq ft | 8.78 | Athena | - |
| Pre-Engineered Building System | Steel roofing system : R-20 Continuous insulation + Polyethylene membrane : Flat wood truss w/ wood decking : Gypsum board + Latex paint | - | Sq ft | 4.17 | Athena | - |
| | Standing seam metal roofing : Metal roof panel assembly : Cavity insulation | - | Sq ft | 12.22 | Athena | - |
| Steel Decking | Steel decking | - | \$ | 3.11 | EIO-LCA | - |
| Lighting | Skylight tubes | - | \$ | 1.450 | EIO-LCA | - |
| Roofing Repairs | | - | | | | |
| | Replacement corrugated roofing | - | \$ | 1.090 | EIO-LCA | - |
| | Replacement metal roofing panels | - | \$ | 0.735 | EIO-LCA | - |
| | Slate shingles | 100,300 | \$ | 0.629 | EIO-LCA | 63.1 |
| | Woodwork, repairs | 3,632 | \$ | 0.558 | EIO-LCA | 2.0 |
| | Epoxy/adhesives | 3,065 | \$ | 1.180 | EIO-LCA | 3.6 |
| | Flashing and Ventilators - copper | 15,100 | \$ | 0.880 | EIO-LCA | 13.3 |
| | Gutters - copper | 380 | \$ | 0.880 | EIO-LCA | 0.3 |
| | Sheathing - polystyrene | 2,460 | \$ | 1.150 | EIO-LCA | 2.8 |
| | Underlayment - waterproofing | 26,198 | \$ | 1.090 | EIO-LCA | 28.6 |
| | INTERIORS | | | | | |
| Average across interior walls | | - | Sq ft | 4.85 | Athena | - |
| | 2X4 Wood stud wall 16" o.c. : 5/8" Gypsum board + 2 coats Latex paint | 10,200 | Sq ft | 1.29 | Athena | 13.2 |
| | 2X4 Wood stud wall 24" o.c. : 5/8" Gypsum board + 2 coats Latex paint | - | Sq ft | 1.26 | Athena | - |
| | 2X4 Wood stud wall 24" o.c. : 2x5/8" Gypsum board + 2 coats Latex paint | - | Sq ft | 2.03 | Athena | - |

Appendix C: Carbon Pricing Detail

The attached print-out provided the pricing data used in this Study.
Low, medium, and high per CO₂e ton prices are presented annually and
with the average over the period of analysis.

Carbon Pricing Scenarios (2005\$/metric ton)

| Year | Forecasted Price Per Metric Ton (2005\$) | | |
|-------------|---|---------------|-------------|
| | Low | Medium | High |
| 2012 | \$ - | \$ 15.00 | \$ 15.00 |
| 2013 | \$ 11.97 | \$ 16.16 | \$ 25.17 |
| 2014 | \$ 12.57 | \$ 17.31 | \$ 35.34 |
| 2015 | \$ 13.20 | \$ 18.47 | \$ 45.51 |
| 2016 | \$ 13.86 | \$ 19.55 | \$ 48.14 |
| 2017 | \$ 14.55 | \$ 20.62 | \$ 50.76 |
| 2018 | \$ 15.28 | \$ 21.70 | \$ 53.39 |
| 2019 | \$ 16.04 | \$ 22.78 | \$ 56.01 |
| 2020 | \$ 16.85 | \$ 23.85 | \$ 58.63 |
| 2021 | \$ 17.69 | \$ 25.18 | \$ 61.89 |
| 2022 | \$ 18.57 | \$ 26.52 | \$ 65.14 |
| 2023 | \$ 19.50 | \$ 27.85 | \$ 68.40 |
| 2024 | \$ 20.48 | \$ 29.18 | \$ 71.65 |
| 2025 | \$ 21.50 | \$ 30.52 | \$ 74.91 |
| 2026 | \$ 22.57 | \$ 32.18 | \$ 78.89 |
| 2027 | \$ 23.70 | \$ 33.85 | \$ 82.86 |
| 2028 | \$ 24.89 | \$ 35.52 | \$ 86.84 |
| 2029 | \$ 26.13 | \$ 37.18 | \$ 90.82 |
| 2030 | \$ 27.44 | \$ 38.85 | \$ 94.80 |
| 2031 | \$ 28.81 | \$ 41.01 | \$ 100.00 |
| 2032 | \$ 30.25 | \$ 43.16 | \$ 105.20 |
| 2033 | \$ 31.77 | \$ 45.31 | \$ 110.40 |
| 2034 | \$ 33.35 | \$ 47.47 | \$ 115.59 |
| 2035 | \$ 35.02 | \$ 49.62 | \$ 120.79 |
| 2036 | \$ 36.77 | \$ 52.34 | \$ 127.33 |
| 2037 | \$ 38.61 | \$ 55.06 | \$ 133.86 |
| 2038 | \$ 40.54 | \$ 57.78 | \$ 140.39 |
| 2039 | \$ 42.57 | \$ 60.50 | \$ 146.92 |
| 2040 | \$ 44.70 | \$ 63.22 | \$ 153.45 |
| 2041 | \$ 46.93 | \$ 66.66 | \$ 161.68 |
| 2042 | \$ 49.28 | \$ 70.10 | \$ 169.90 |
| Average: | \$ 25.66 | \$ 36.92 | \$ 88.70 |

Sources: Center for Resource Solutions; BAE 2012.

Appendix C: Carbon Pricing Detail

The attached print-out provided the pricing data used in this Study.
Low, medium, and high per CO₂e ton prices are presented annually and
with the average over the period of analysis.

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Appendix D: Cost Estimation Systems Review

This Appendix was prepared by Preservation Associates and is taken from the original Demonstration Plan.

Cost Estimation System Review

The following list of ten final cost estimating programs selected for further analysis has not yet been entirely completed. We reviewed over 100 cost estimating programs located on the Internet through on-line searches and specific site acquisition. Our goal is to select and use an on-line available cost-estimating program that the DoD could easily switch to if that was their desire. From a brief scan of each program located, we have selected the following ten finalists.

Our list of selection criteria for considering any cost estimating program consisted of federal agency use, flexibility, customization potential, preliminary budget estimating potential, estimating potential without fully detailed plans and specifications, specific mention of renovation project use, though such mentions were absent in the vast majority of programs found and parametric modeling. Clearly the estimating program development and support industry has not targeted restoration, rehabilitation or renovation projects. Very few programs have any real experience with such existing building construction projects. Only three programs listed below either list or are known to have experience and data based numbers that fit some applications that target our project building types.

Our intention as seen at the end of this preliminary submission of this addendum is to further research the ten finalist programs. In some cases we have already tried the down loadable free trials of the software. In other cases we still intend to download the free trial versions to get a better handle on their capabilities.

At this time, the ten final programs currently under consideration are listed following this paragraph. They are selected for intensive review with web site designer comments, pros and cons as well as decisions listed by Reed and James. Each of the ten programs They will remain as potential programs and not exclusively so until we have actually developed one building and applied the information to an estimating process.

Our goal is to select and use an on-line available cost estimating program that the DoD could easily switch to if that was their desire.

Final Ten Cost Estimating Programs: selected for intensive review with web site designer comments, pros and cons as well as decisions listed by Reed and James.

To date, my top four picks are RS Means, CostLink/AE, US Cost Success Estimator and PACES.

COST LINK/AE

<http://www.bssoftlink.com/costlinkae/ae.htm>

The following comments were taken directly from their web site.

“BSD CostLink®/AE provides quick, easy, and modifiable cost estimates using built-in RS Means Cost Data. It was created exclusively for design professionals (and building owners) who like to keep things simple without sacrificing accuracy or flexibility.

Welcome to a cost-estimating package specifically designed for architects, engineers, and others who are doing budgets, cost plans, and design development estimates. CostLink/AE is designed for design professionals by design professionals. Let's face it, you don't want to spend lots of time learning or using a complex cost estimating system. You only have time for a cost estimating system that is quick, easy, and modifiable—and doesn't take much time to learn. Enter CostLink/AE:

QUICK: Create a reliable, accurate, and detailed cost estimate in 10 minutes or less! CostLink/AE provides a simple front-end cost modeling interface that allows rapid creation of a cost estimate at the very earliest stages of a project. Because your estimate is a "living" document, you can continually refine and modify it as your project evolves.

EASY: With CostLink/AE's unique front-end Cost Modeling interface (based on the reliable, built-in RS Means cost data that you've come to trust), you simply:

- Pick one of the 75 building models that are similar to your project.

| <u>Residential</u> | <u>Educational</u> | <u>Health/Day Care</u> | <u>Business</u> | <u>Office</u> | <u>Govt. Public Facility</u> | <u>Social. Recreation, Entertainment</u> | <u>Hospitality</u> | <u>Religion</u> | <u>Transport. Auto</u> | <u>Industrial</u> |
|------------------------------|------------------------------|-----------------------------------|---------------------------|-------------------------|------------------------------|--|--------------------|---------------------|-----------------------------|-------------------|
| Apartment, 1-3 Story | Auditorium | Day Care Center | Bank | Medical Office, 1-Story | Courthouse, 1 Story | Bowling Alley | Hotel, 4-7 Story | Church | Auto Sales | Factory, 1 Story |
| Apartment, 4-7 Story | College Classroom, 2-3 Story | Hospital, 2-3 Story | Convenience Store | Medical Office, 2 Story | Courthouse, 2-3 Story | Community Center | Hotel, 8-24 Story | Religious Education | Auto Repair Garage | Factory, 3 Story |
| Apartment, 8-24 Story | College Dormitory, 2-3 Story | Hospital, 4-8 Story | Department Store, 1 Story | Office, 1 Story | Fire Station, 1 Story | Country Club | Motel, 1 Story | | Bus Terminal | Warehouse |
| College Dormitory, 2-3 Story | College Dormitory, 4-8 Story | Medical Office, 1-3 Story | Department Store, 3 Story | Office, 2-4 Story | Fire Station, 2 Story | Gymnasium | Motel, 2-3 Story | | Car Wash | Warehouse, Mini |
| College Dormitory, 4-8 Story | College Laboratory | Medical Office, 2 Story | Funeral Home | Office, 5-10 Story | Jail | Movie Theater | Restaurant | | Hangar, Aircraft | |
| Fraternity/Sorority House | College Student Union | Nursing Home | Laundromat | Office, 11-20 Story | Library | Racquetball Court | | | Parking Garage | |
| Nursing Home | Elementary School | Assisted Living Facility, 1-Story | Restaurant | Telephone Exchange | Police Station | Rink, Hockey/Indoor Soccer | | | Parking Garage, Underground | |
| | Fraternity/Sorority House | Outpatient Surgical Center | Restaurant, Fast Food | Computer/Data Center | Post Office | Social Club | | | Service Station | |
| | Gymnasium | | Retail Store | | Town Hall, 1 Story | Swimming Pool, Enclosed | | | | |
| | High School, 2-3 Story | | Supermarket | | Town Hall, 2-3 Story | | | | | |
| | Jr High School, 2-3 Story | | | | | | | | | |
| | Library | | | | | | | | | |
| | Vocational School | | | | | | | | | |

- Note: Some building types are shown in more than one category.

- Select the frame and enclosure systems.
- Enter the gross area and building perimeter.
- Select optional additive items from a list appropriate to your building type.
- If necessary, adjust project location and various mark-ups.

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CostLink/AE then automatically generates an instant cost estimate for you. You can immediately view or print the estimate in as much or as little detail as necessary with our flexible data display options.

Built-in RS Means data: With RS Means cost data built-in and seamlessly integrated with your cost estimate, we've already done most of the work for you.

MODIFIABLE: Your estimate can be refined and updated quickly and easily as your project evolves. You can refine your estimate by changing quantities, by making simple drag-and-drop material substitutions from the built-in RS Means databases, or by adding materials and systems common to your project type—all with minimal input time and effort.

11,000 installed assembly costs, 20,000 installed line item costs, 75 parametric models, prebuilt templates for assembling your cost estimates by UniFormat, MasterFormat, or any customized work breakdown structure; cost factors for over 700 U.S. locations.”

PROS:

- Uses R.S. Means cost data
- Does not require detailed plans and specs
- Building Systems Design, Inc. in business since 1983
- Good reputation; partners with the AIA, CSI, and R.S. Means
- Parametric cost modeling: Parametric modeling seems to be very useful from the point of view of the projects to be estimated, as that approach is based more on areas than a lot of specific line items.

CONS:

- May perhaps be too simple for our type of project
- Seems more geared to new construction, no emphasis on restoration or rehabilitation
- May lack sufficient building models for use on a military base
- Lacks numerous work component, labor and material cost items for restoration and rehabilitation projects

Decision:

The CostLink/AE Estimating program will be used to cross check estimates with the RSMeans programs. If CostLink/AE works well for our purposes, we may switch to using the CostLink program as the primary estimating program and use RSMeans as the cross check, back-up system. CostLink/AE should allow us to quickly estimate the various projects. However, the drawback is the number of inputs we would need to calculate and enter into the system for the specific special works needed in all restoration, rehabilitation and even into renovation projects.

We may only need to work up one set of the specific numbers for both the R. S. Means Estimating System and the CostLink/AE system. If that is the case, we will use both the CostLink/AE System as well as the R. S. Means Cost Estimating System cross checking all estimates for accuracy.

RS MEANS Construction Data Systems

<http://www.meanscostworks.com/>

There are three methods available for estimating from RSMeans: Manuals for hand calculations or field referencing costs; CDs of various programs for estimating, bidding, job accounting, construction management, etc; or the new CostWorks on-line interactive estimating program.

The following comments were taken directly from their web site concerning the on-line CostWorks program.

“What is MeansCostWorks.com?”

It is 24/7 online access to the famous RSMeans database of construction and square foot costs, combined with comprehensive estimating capabilities that can be tailored to your specific needs. MeansCostWorks.com offers all 85,000 RSMeans UNIT PRICES, 25,000 BUILDING ASSEMBLIES and 42,000 FACILITIES REPAIR & REMODELING COSTS covering every category of construction. You can estimate with open shop or union labor costs, SI Metric or U.S. Customary units, traditional 16-Division or new 50-Division CSI format. Costs can be adjusted automatically for local materials and labor cost conditions.

How does it work?

You simply subscribe and set up your estimating and cost book preferences. You can then make a reliable Construction Cost estimate or Square Foot estimate using the simplified Means cost tables, or simply look up selected line items as needed. You can customize, save, preview, create reports, export data to Excel and share your estimates online with other project team members.

Who is MeansCostWorks.com for?

MeansCostWorks.com is for any professional who wants fast access to accurate construction cost data with estimating functions, such as estimators, contractors, designers, engineers, architects, facilities professionals, government officials, universities.”

PROS:

- Longest established construction database company in US
- Industry standard cost databases
- Ease of use with internet resident documents

- Paired with other data based programs used by federal agencies including DoD

CONS:

- Developed mainly for construction companies
- Requires detailed knowledge of materials used in the project
- Perhaps too detailed and comprehensive for conceptual projects
- Has PC based CD program for estimating
- Has manuals for use in field and for hand calculations for older buildings that aid in building library of custom numbers needed for estimating older structures.

Decision:

RS Means has developed and supports three ways to bid projects. The CostWorks online program listed above is one system. You can purchase CDs and perform bids and estimates on your own computer off-line, or, if needed, purchase the data manuals and perform bids and estimates in the field or office by hand calculation. Often this is a necessary exercise for older, historic buildings. We have tried the 2-week trial period of CostWorks, but there was so much work in developing our own library of historic building work components, we switched to the manuals and performed to estimate by hand and then entered the data into the CD computer version of the program. We found we were able to calculate the estimates to within reasonable expectations. It is our intention to utilize this program of manuals and CDs by RS Means and cross check the results with CostLink/AE listed above.

Eos ADVISER

<http://www.eosgroup.com/>

The following comments were taken directly from their web site.

“Eos Group leverages the Sage Timberline Office construction estimating software as an enterprise estimating platform for market-leading firms in the Building, Industrial, Process, Transportation, Environmental and Energy markets. Our goal is to improve your business through increased productivity and improved efficiency - a successful combination of Sage Timberline Office construction estimating software, and Eos Group software and professional services.

Eos Explorer:

As a comprehensive tool that manages all the different aspects of the preconstruction estimating process, Eos Explorer addresses the request, creation, management, verification, review and reporting work processes related to estimating. Eos Explorer is a highly-configurable collaboration platform, allowing your preconstruction team to have input and visibility into the estimate development process. It provides a comprehensive overview of all project estimates, including

resource planning, tracking development stages (Conceptual, Schematic, etc.), estimating volume, project types and estimate status (Awarded, Lost, etc.).

With Eos Explorer, you can (Features):

- Control user capabilities and data access through a comprehensive security system
- Manage an unlimited number of estimates across a single or multi-office estimating department
- Control the estimate creation process including enforcement of corporate standards and establishing required fields
- Track all estimating-related files (Microsoft Excel® & Word®, PDF, JPG, etc.)
- Create and manage unlimited, user-defined job classifications for use in categorizing, retrieving and reporting across estimates
- Track unlimited, user-defined company types (Architect, Civil Engineer, Owner's Rep) or user-defined resources (Senior Estimator, Electrical Estimator) and utilization rates across estimates
- Search for estimates in the repository based on user-defined attributes (job size, project characteristic, region, etc.)
- Archive and retrieve past estimates and related documents
- Export directly into Microsoft Excel®, Outlook® & Project®

Benefits

The benefits of Eos Explorer can create efficiencies throughout your entire company.

- Gain control of the estimate management process
- Create and manage a master list of all estimates - even across multiple offices
- Establish required fields when creating new estimates
- Enforce the use of templates to ensure consistency
- Control which users can view and edit specific estimate folders
- Search and locate estimates on your local computer, in your regional office, or across multiple offices
- Assign estimating staff to estimates and track resource utilization
- Validate estimates through rules-based diagnostics
- Generate trending reports, perform won/lost analysis, or track volume per estimator
- Generate estimate trending reports across estimate types, project types, clients and time periods
- Create enterprise bid schedules in MS Project® to plan and forecast estimates and resource utilization.

Eos Adviser:

Eos Adviser is a web-based budget estimating solution built for the pre-construction and design-build markets. It is a quick and easy way to access your company's historical data to establish conceptual or feasibility estimates and benchmarking studies. In just a few short steps, you can

generate averages, as well as ranges of normalized costs for each element of a given project. Advisor addresses all the categories of the design/build markets and can automatically adjust for location and time adjustment, escalating historical costs to present-day or future costs.

Advisor allows estimators, project managers and business development staff to quickly search past budgets and adjust current projects for inflation, job size and location, and supports the benchmarking process so they can make better decisions and reduce risks.

With Advisor, you can (Features):

- Import and store an unlimited number of projects from detailed estimating and cost management systems
- Add an unlimited number of attributes to projects for use in classifying and retrieving them
- Browse historical data using a user-defined classification system (vertical industry, building types, etc.)
- Search for historical data based on user-defined attributes (job size, project characteristic, region, etc.)
- Define an unlimited number of cost elements and cost categories
- Compare selected budgets and/or cost elements side-by-side in chart or table format
- Export directly into Microsoft Excel on the user's machine

Benefits

The benefits of Advisor are both powerful and useful:

- Produce better budget estimates faster than your competition, and cheaper than you're doing them now
- Respond to new business opportunities with defensible data based on your history
- Reduce risks by performing 'sanity checks' (benchmarking) in minutes, rather than hours or days
- Provide enterprise-wide access to historical data through centralized storage of historical projects
- Collect proprietary data into an open, common repository accessible by industry-standard tools
- Make the most of existing investments by leveraging existing data and technologies
- Reduce IT costs through a centralized management and a zero-install (thin) client deployment"

PROS:

- Very well thought through and complete system
- Has different programs for different uses (e.g., Eos Advisor for budget estimates, Eos Explorer for more detailed projects)

- Can use historical data from previous projects (a benefit only when your company has a database of previous work)
- Uses Sage Timberline software for actual construction estimating (see #7 below)
- Eos Group, Inc. founded in 1995

CONS:

- Developed for larger companies with large projects and multiple projects to estimate and bid which could be useful for military base facility managers
- Apparently need to get several different software packages for our purposes
- Also lacks specific information necessary for restoration, rehabilitation and renovation type projects

Decision:

Eos Advisor and Eos Explorer are both very good systems. The Eos Advisor is specifically oriented to budget estimates. If there was a data base already available for use with this system relating to the existing buildings we are to review I would select this system first or possibly second over the others depending on the reliability of the data base. However, without an established data base, it may prove too time consuming beyond what is already necessary to produce for the development of 24 accurate estimates.

MAXWELL SYSTEMS QUESTMX ESTIMATOR

<http://questestimating.maxwellsystems.com//index.php?action=maxwell/products/estimation/quest>

The following comments were taken directly from their web site.

“QuestMX Estimator, the industry's premier all-in-one takeoff and estimating solution, provides tools that help you bid more jobs, win more work, and increase profitability. Beginning with digitized takeoff and concluding with generating the final bid, QuestMX offers unique features to ensure accuracy and efficiency.

Learn more about the key capabilities of QuestMX Estimator:

- Digitized Takeoff
- Notepad
- Database
- Estimate
- Summary
- Bid Day and Proposals
- Change Orders
- Purchase Orders
- 3-D Visual Assemblies

- Integration with Accounting

Key Benefits:

- Takeoff and estimating solution in a single convenient application
- Complete more estimates and detailed bids in a fraction of the time it's taking you now
- Improve accuracy of estimates and avoid costly mistakes
- Increase efficiency and speed across the entire estimating process”

Two of the seven reasons given on their website as to why you should choose them:

1. You need construction-specific solutions that improve the way you do business.

Maxwell Systems has earned its reputation as an innovator of software solutions, exclusively serving the construction industry including General Construction; Subcontractor, Specialty Trade, and Service; Heavy Construction, and Property Management. For more than 30 years, we've been a trusted leader with the knowledge and stability to meet the changing needs of an evolving industry. Our award-winning software is leading the industry in trade-specific solutions that meet the business requirements of construction company owners and empower the workforce with tools that streamline processes and maximize profits for every project.

Maxwell Systems is truly unique by addressing the entire construction project lifecycle — from digital takeoff through final cash payment. We offer contractors end-to-end, integrated software solutions that enable a new level of continuity and productivity across the company, as well as allow construction business owners to achieve better insight, analysis, and financial oversight for strategic and timely decision making.

2. You want easy-to-learn, easy-to-use software without sacrificing robust functionality.

Our solution-centric approach to software development and service allows us to partner with customers to best ensure each has the training and knowledge to use the software as it best suits their unique needs. We provide "blended training" so that you can choose from learning in a classroom setting at one of our regional facilities, learning online through individual or group sessions, or learning the software by having one of our training professionals come to your office and train on your own system. There is training that's convenient for any customer, any need, and any location.

Our solutions are mature with advanced functionality and broad capabilities. They are proven solutions with hundreds of installs every year. Industry professionals, customer feedback, and years of experience have shaped the industry-specific software solutions that Maxwell Systems offers today. An end-to-end software solution is available for any size business, and each solution is

tailored to fit a specific industry segment. So contractors are sure to find the ideal software solution to help run their business with improved efficiency and accuracy whether at the office, warehouse, field, or plant.”

PROS:

- Maxwell Systems has been in business since 1975
- The program has digital take-off as an integral feature
- Estimating, Job Accounting and Project Management

CONS:

- Geared towards construction companies
- It is not clear how well this works for conceptual projects without plans and specs

Decision:

The “QuestMX Estimator” appears to be a good system, but it also lacks the requisite cost items for restoration, rehabilitation and renovation. There is no established data. Lacking any clear indication the system works well and quickly with planning level plans and specification, the QuestMX Estimator system was not chosen for this project.

QUICK BID

<http://www.oncenter.com/products/qb/index.html>

The following comments were taken directly from their web site.

“By doing away with the manual takeoff process and automating all of your calculations, On-Screen Takeoff and Quick Bid can help you drastically reduce missed items and miscalculations. Everyone knows that these two mistakes can be very costly and bite into your profits. With On-Screen Takeoff, you will be able to view, measure, and markup plans on the screen. Measuring square footage, perimeters, and volumes of simple and complex rooms has never been easier. Once you have marked all of your walls, doors, flooring, roofing, electrical, etc... you can then import of this data from OST into Quick Bid.

Once the takeoff is complete, contractors import the information to Quick Bid to create accurate bids and well organized reports. With this construction software, estimators and contractors can easily track material and labor costs, burdens, tax, and overhead. You can quickly apply material pricing from predefined databases. In addition, Quick Bid allows you to calculate and adjust on-the-fly labor rates, tax, profit, and misc expenditures.

INCREASE ACCURACY AND PROFITS

ESTCP Project Number SI 0931

- Minimize data-entry mistakes and calculation errors
- Avoid bidding too low or too high by knowing the cost of the job before submitting it
- Quickly fine-tune labor production
- Evaluate detailed cost information
- Break down labor by crew, unit, price, lump sum price, production, or man-days
- Analyze material, labor rates, change orders, and alternates
- Add indirect and direct expenses, contingencies and any special conditions
- Control material costs by conditions linked directly with On-Screen Takeoff® quantity detail

SAVE TIME IN THE BID PROCESS

- Automatically calculate material and instantly generate materials lists
- Easily update price quotes and quickly recalculate last-minute addendum changes
- Minimize time for change orders and alternates
- Assemblies:
 - Access a library of assemblies that store condition specific material information and labor production with a click of a button
 - [Click here to learn about some of the current manufacturers that have contributed assemblies to Quick Bid users.](#)
- eQuote:
 - Submit and receive material quote requests from suppliers quickly via this email feature.
 - [Click here to learn more about eQuote](#)

STAY ORGANIZED

- Document and organize information to track and analyze changes as the project evolves
- Create reports that provide an explanation of all costs associated with the intended scope(s) of work
- Compare unit price of bid against historical cost data
- Single out conditions by area, section, division, floor, room etc
- The ability to have multiple users in a database at the same time providing consistency and control over projects”

PROS:

- Easily handles large projects
- Ease of use with coordinated take-off program
- Customizable
- Digitized take-off

CONS:

- Geared towards contractors bidding on jobs

- It is not clear how well this works for conceptual projects without detailed plans and specs
- Does not appear to have much data on restoration, rehabilitation or renovation
- Not clear on how well budget estimates can be put together

Decision:

Lacking the necessary data base needed for restoration, rehabilitation or renovation projects and not appearing to be as customizable as needed to input necessary data if chosen, we are not selecting this product.

PLAN SWIFT

<http://www.planswift.com/>

The following comments were taken directly from their web site.

“Top 10 Reasons to Buy PlanSwift:

- PlanSwift is very easy to learn. Just point and click!
- Most estimators can estimate 10X as fast using PlanSwift vs. traditional methods (ruler & highlighter).
- Astounding accuracy. Precisely trace/digitize items on the plan using your mouse or a digitizer.
- Create an audit trail...if it's colored, it's counted!
- Save \$ on gas, printing, and shipping costs. No more driving to pick up plans...just email them.
- Top rated customer support...we have REAL ESTIMATORS on staff who can speak your lingo!
- Go Green! Go Paperless! It's cheaper, faster, and more environmentally friendly.
- Best value for your \$. As shown in our testimonials, you get the most features for the best price.
- Extremely customizable & powerful. The software can be customized to suit your exact needs. You can do your takeoff + estimate in the same software.
- PlanSwift is becoming the platform. Because of its integration capabilities and our SDK (Software Developers Kit), many online planrooms and estimating software partners are creating integrations which will allow you as a customer to have a positive, integrated experience. Check out our partner's page.”

PROS:

- Customizable
- Widely used
- Do take-off and estimate in the same program

CONS:

- Geared towards contractors bidding on jobs
- It is not clear how well this works for conceptual projects without plans and specs companies

Decision:

PlanSwift by Tech Unlimited, Inc. does appear to be a good selection for many estimating applications, and lacking better website information concerning budget preparations, we decided not to use the Plan Swift program.

SAGE TIMBERLINE MASTER BUILDER/OFFICE

http://www.sagecre.com/products/master_builder/estimating

http://www.sagecre.com/products/timberline_office

The following comments were taken directly from their web site.

“Save time, curb risk, and maximize profits by automating your estimating. Sage estimating solutions give you multiple take-off options, industry-specific pricing databases, and integration with our accounting modules. With Sage Timberline Office construction software you have the tools to build winning estimates and profitability into each job.

Sage Timberline Office construction bid software solutions get extra muscle from a full range of industry-specific databases. Packed with thousands of items, these databases are easily modified so you can enhance them with your own unique items, formulas, and assemblies. You can also choose to integrate with RSMMeans or update prices from Trade Service Corporation.

Estimating Basic:

This is the minimal version, and is not appropriate for our project.

Estimating Standard:

Built to accommodate company growth, Estimating Standard serves as the foundation of proven reliability, functionality, and flexibility. Maximize productivity and profitability by creating more bids in less time. You'll win more jobs and curb risks with the assurance of accurate and error-free estimates. The Database Builder Wizard walks you through the time-consuming task of set up to get you operational quickly.

Database Builder Wizard

Let the Database Wizard walk you through and streamline the customization setup of your database to get you up and running quickly and efficiently. You'll get the power you need to create twice as many estimates compared to generic spreadsheets—meeting deadlines with ease while presenting the kind of comprehensive, precise estimates that win you more jobs and increase revenue.

Easy to Learn

Estimating Standard includes a comprehensive online help system that slashes the learning curve as you use software help to walk step-by-step through many of the common estimating tasks. You can also do key word searches, review the table of contents, and locate by topic answers to your questions. These capabilities make Estimating Standard extremely easy to learn—a good tool for getting new estimators up to speed quickly.

Key Efficiencies

Estimating Standard combines key estimating efficiencies with all the ease and intuitive point-and-click, drag-and-drop technology available. Take advantage of industry-specific databases including RS Means for even more estimating muscle. And, with Explorer, you can sort estimates by estimator, bid date, estimate number, and job type with the Estimating Explorer management tool.

Advanced Spreadsheet Capability

With Estimating Standard's spreadsheet, everything you need to build an estimate is available with the click of a mouse. Estimating Standard makes it easy to analyze and fine-tune your estimates. You can rename and move columns around. Open and compare several estimates at once. Even drag items from one spreadsheet into another for quick creation of new or alternate estimates.

Want to view your work by location? You can do that too. In fact, with the click of a mouse you can look at your estimate by division or item, takeoff order, assembly, bid item or other user-defined Work Breakdown Structure (WBS) code. You can also create and save unlimited, personalized views of the spreadsheet while you work. So later, you can see the estimate just the way you need to during review. Plus, estimates can be viewed in full detail or summarized to the major estimate divisions.

Ever forget to save your work? Don't worry. Unlike typical memory-based spreadsheets, Estimating Standard's disk-based spreadsheet resides on your hard drive. So you never have to save your estimate. Or worry about losing your work.

Fast Takeoff

There's more than one way to do takeoff. Estimating Standard gives you several—all designed to give you more accurate estimates, in less time:

- Quick takeoff—Simply drag one or more items from the database directly into the spreadsheet. Enter dimensions and the software automatically calculates all quantities for you.
- Item takeoff—If you want to work with database items before they go into your estimate, you can drag them into the item takeoff window. When you're ready, just click the OK button to add them to your spreadsheet.
- Smart Assemblies—To save lots of time, you can take off all the items of a wall, door, concrete slab or other building component in just one step. Estimating databases include a variety of common assemblies that you can modify. Or you can build your own.

Estimating Explorer

The key to estimate control is organization. Estimating Explorer eliminates time-intensive searches by automatically creating an up-to-date master list and description of every estimate in your system. Within seconds you can sort your estimates by estimator, bid date, estimate number or a variety of other criteria to locate an estimate. Once you do, you're just one click away from the estimate's spreadsheet.

Managing your estimates also means understanding the big picture. Estimating Explorer not only organizes your estimates, but gives you the tools to stand back and analyze your work. Need to know what your estimating volume is by estimator? Or your year-to-date estimate volume? You can find these and many other answers using Estimating Explorer's management reports and graphs. Estimate information can also be linked to Microsoft Excel or Access for further analysis or custom graphing.

Presentation-quality reports

These days, your numbers have to look good. With Estimating Standard, you can produce professional-looking, easy to-understand reports for clients and upper management. Not only can you control the look of your reports, you can control the content. You can create custom headers and footers and include graphics. And Estimating Standard's WYSIWYG (what you see is what you get) reporting lets you quickly strip, add to and tweak the estimate report just the way you want. Then print. Professional reporting has never been simpler.

Estimating Extended:

Sage Timberline Office estimating software offers the most comprehensive package of estimating

tools available. Starting with the power of the Estimating Standard module, Extended offers greater takeoff, analysis, and productivity capabilities such as Model Estimating, an advanced conceptual estimating tool. Create detailed, accurate conceptual estimates quickly through an onscreen project questionnaire—Model Estimating does the rest.

Simplified Setup

Spend less time getting started and more time growing your business with Sage Timberline Office estimating software. The time-consuming task of setting up and building a database has been streamlined with the Database Builder Wizard. The Wizard walks you through the necessary steps of establishing your database more quickly and efficiently, saving you time and money and allowing you to quickly take full advantage of the Estimating software sooner.

Slash takeoff time

Estimating Extended offers estimators several ways to take off estimates in less time. With quick takeoff, you simply drag individual or groups of items from the cost database directly into the spreadsheet on the screen. Enter dimensions, and Sage Timberline Office estimating software calculates all quantities for you. Or, if you prefer, you can use item takeoff to work with items prior to pulling them into the spreadsheet.

For ultimate time-savings, Smart Assemblies or Model Takeoff is your tool, letting you take off all the items in a wall, door, concrete slab or an entire building core and shell all at once. A takeoff audit trail is also included in Estimating Extended, so you can double-check your work at any time.

Manage complex estimating with variable pricing

Choose the materials pricing and labor production rates that make the most sense for the job whether that means the default settings or your own custom prices and rates. You're able to store up to 20 different prices for a single item and 10 different labor production rates.

Create detailed conceptual estimates in minutes

Model Estimating helps you generate detailed conceptual estimates by answering a series of basic questions about a project. You simply respond to an on-screen survey and let Model Estimating tap into the first-of-a-kind Knowledgebase of Sage Timberline Office estimating software: Electrical, Commercial or Residential, to produce fast, precise estimates. Backed by extensive detail, everything you need to support your bid, concept, or estimate is there in black and white—costs, quantities, crews, hours, and waste factors.

And with Model Estimating, you can easily modify and monitor your estimate as changes are made to the design or project plan. You'll know exactly how those changes impact your estimate, before they add up to a budget issue,

Keep bids and quotes within reach

The subcontractor bid grid of Sage Timberline Office estimating software offers a simple way to store, analyze and select subcontractor bids and quotes by individual or groups of items. Log each subcontractor's name, bid quantity, unit price, total bid amount, and any notes in the pop-up grid. Then just click on the bid you'd like to use, and the estimate instantly calculates the item based on your decision. What if you change your mind? Simply check a replacement bid, and the substitution is made instantly.

See it all from a new angle

With Work Breakdown Structure (WBS) codes, you can organize estimates a variety of ways: by Phase Drawing detail or Location, like Floor 1 or 2. Just define and assign your own WBS codes to any estimate item, either in the database or during takeoff. With the ability to attach up to 12 WBS codes to each item, your analysis and reporting possibilities are endless with Sage Timberline Office estimating software. Not only can you work with an estimate in any order you choose, you can change the order instantly using the sequencing tabs at the bottom of the spreadsheet.

Easily make adjustments

Whether it's during analysis or at the last minute, making adjustments to an estimate is a snap in Estimating Extended. The software's adjust columns feature lets you revise all, or a portion of, the quantities, amounts, and prices contained within a column at once. Calculate by a percentage, by multiplying or dividing an amount, by replacing an amount, or by spreading an amount proportionally over the selection.

On bid day, when time is everything, adjustments can be easily made through the Estimating Extended totals page. Log in last-minute cuts and adds, and the software automatically generates the change throughout all the affected areas of the estimate. Or use the adjust job totals feature to match a pre-defined job total or cost per unit, or to play with the final numbers.

Go global

Estimating Extended makes it easy for you to take off an estimate in one system of measurement and deliver it in another. With Sage Timberline Office estimating software, estimates can automatically be converted from Imperial units to metric units or vice versa.

Estimating Explorer

The key to estimate control is organization. Estimating Explorer eliminates time-intensive searches by automatically creating an up-to-date master list and description of every estimate in your system. Within seconds you can sort your estimates by estimator, bid date, estimate number or a variety of other criteria to locate an estimate. Once you do, you're just one click away from the estimate's spreadsheet

Managing your estimates also means understanding the big picture. Estimating Explorer not only organizes your estimates, but gives you the tools to stand back and analyze your work. Need to know what your estimating volume is by estimator? Or your year-to-date estimate volume? You can find these and many other answers using Estimating Explorer's management reports and graphs. Estimate information can also be linked to Microsoft Excel or Access for further analysis or custom graphing.

Present your work with flair

With so much riding on it, it's critical that the work you produce for clients and upper management be professional-looking and easy to understand. Estimating Extended reports are just that, with the ability to include different type fonts and sizes, bolding, italics and colors. Using Sage Timberline Office estimating software, you can create custom headers and footers, including graphics, and use WYSIWYG (what you see is what you get) reporting to quickly strip, add to and tweak an estimate report just the way you want.

Sage Timberline Office estimating software also delivers a number of advanced reports to help in estimate analysis.

Print the cost variance report to quickly see where costs and quantities have varied between two similar projects. Or view the cost comparison report to zero in on where unit costs have changed between conceptual, interim, and final estimates on a project.

Estimating Modules

Our complete line of job estimating software modules make it simple to customize your system for your specific needs and requirements. No matter what size your company is, or what kind of construction or real estate business you're involved in, our modules will help streamline your estimating processes and boost your productivity. Note: For use with Estimating Standard or Estimating Extended only.

Estimating Databases

Choose to jumpstart your database building efforts by tapping into a variety of pre-build industry-specific estimating databases. Easily modified, these databases contain thousands of items which can be updated with your own prices and productivity factors. Incorporating your company's own estimating procedures and policies as they relate to unique items, formulas, assemblies, and productivity factors will ensure you generate more precise estimates with improved efficiency.”

PROS:

- Widely used, well-respected program
- Many ways to customize

CONS:

- Geared towards construction companies
- Intended for use by companies doing many estimates
- Marketing information does not mention renovation projects specifically
- It is not clear how well this works with conceptual projects that do not have detailed plans and specs

Decision:

Website lacks specific information on existing building estimating. We did not choose this product.

US COST SUCCESS ESTIMATOR

<http://www.uscost.com/successestimator.asp>

The following comments were taken directly from their web site.

“Powerful, Flexible Estimating Software

Since 1991 Success Estimator has been used by architects, engineers, construction managers, owners and government agencies worldwide. Its unparalleled combination of off-the-shelf estimating functionality and customization capability make it the ideal solution for any organization with unique estimating requirements. From user-defined parametric cost models to detailed “bottom-up” estimates, Success Estimator’s ability to conform to your company's methods & procedures is simply unmatched.

Features and Benefits

LOOK-UP TOOL

Easily search among thousands of cost items or assemblies using partial text based descriptions in seconds. The user is also given the unit cost information for the item / assembly and can also quantify it prior to adding it to the project.

CITY INDEX TOOL

ESTCP Project Number SI 0931

Increase the accuracy of your R.S. Means based projects by instantly applying the Means city index factors based on state, city and zip code. Adjust labor, equipment and material costs for all line items.

PARAMETRIC COST MODELS

Success Estimator's powerful modeling capabilities allow companies to use their own specific legacy data and engineering algorithms to develop meaningful, accurate cost models. As more information becomes available, information in the model can be adjusted at a very detailed level, taking the estimate from feasibility to 100% completion.

CENTRALIZED COST DATA

Use R.S. Means, Richardson's and your company's legacy cost data individually or in combination on any estimate thereby insuring the most accurate and up-to-date information is being used.

ASSEMBLIES

Generate estimates faster than ever before by utilizing one of the many R.S. Means Assemblies libraries or build unique custom assemblies with your company's legacy cost information.

ESTIMATE ANALYSIS

Compare actuals to estimates, variances across multiple projects or cost trends on commodities by using one of the numerous macros shipped as part of Success Estimator. Use the Success Estimator Visual Basic programming language to write custom macros directly in the base application.

CONNECTIVITY

Seamlessly integrate Success Estimator as part of your overall cost controls program. Shipped as part of the base application, AutomationTool allows integration and interoperability with other enterprise applications such as CAD, Accounting, Project Management, Inventory Management and various SQL databases.

SCHEDULE EXCHANGE

Schedule Exchange provides the enterprise with a flexible data exchange engine allowing for the seamless synchronization of your Primavera® Schedule and your Success Estimator estimate, not only saving time, but increasing the efficiency of both applications.

SUPERIOR SUPPORT & SERVICES

Every Success Estimator sale is backed by the cost professionals at U.S. COST. For over 20 years our team of estimators, engineers, developers and analysts have provided exceptional professional services supporting our clients throughout the entire estimating process.

PUBLISH ESTIMATES TO SUCCESS ENTERPRISE

Combine Success Estimator & Success Enterprise to form a powerful, global estimating

suite. Enable all estimating stake holders to have access to the entire estimating enterprise via any internet-connected computer.

Call 1.800.955.1385 inside U.S. or 770.481.1600 outside U.S. for a free on-line presentation or more information. Or email us at sales@uscost.com “

↑ Top

Why use Success? Just ask our clients

Architect of the Capitol
Bechtel
Federal Aviation Admin.
HNTB
Lockheed Martin
NASA
U.S. Department of Defense
U.S. Department of Energy
U.S. Department of State
U.S. General Services Admin.
U.S. Marine Corps
U.S. Navy”

PROS:

- U. S. Cost, Inc. has been in business since 1983
- Customizable
- History of government use including Department of Defense
- Parametric cost modeling. Parametric modeling seems to be very useful from the point of view of the projects to be estimated, as that approach is based more on areas than a lot of specific line items.

CONS:

- Marketing information does not mention renovation projects specifically
- It is not clear how well this works with conceptual projects that do not have detailed plans and specs

Decision:

As with all the other cost estimating programs listed in this addendum, the program is long on new construction and short on capabilities with older existing building construction activities.

However, this program has many good attributes and we may try the free on-line program to test its capabilities.

WINESTIMATOR

<http://www.winest.com/products/estimatingsoftware/default.aspx>

The following comments were taken directly from their web site.

“WinEst eTeam is the professional estimator's solution for efficient project cost estimating teamwork. It is designed for companies where collaborative estimating is important.

With WinEst eTeam, estimates can be produced and shared from anywhere, across the hall or across the globe.

Estimators of all disciplines can collaborate on the same estimate at the same time, across networks or the Internet.”

Additional eTeam Benefits:

Collaborative Communication

- Enables multiple estimator teamwork, sharing and input, on the same estimate, at the same time.
- File security and access controls help safely accommodate and coordinate multiple estimators

What If Analysis

- Apply estimate items to base or up to 700 alternates.
- Control alternate status within the estimate: pending, approved, denied.

Internet Connectivity

- Easily email estimates between project team members
- Share cost knowledge databases and estimate information via the web.
- Broadcast RFI's to select vendors, supplies or subs based on a variety of criteria.

Interfaces

- Built-in flexible export design tool allows multiple application interfaces.

Multiple Document Interface

- Open multiple estimates at a time and easily drag and drop items between multiple estimates.

Reports and Forms

- Customizable reports.

- Business forms tools allow flexible creation of customized HTML and RTF-based business forms and documents.”

PROS:

- Takeoff program available as an add-on
- Customizable
- Ability for multiple users to work on the estimate simultaneously

CONS:

- Marketing information does not mention renovation projects specifically
- It is not clear how well this works with conceptual projects that do not have detailed plans and specs

Decision:

We did not choose this program since there were others that met our program needs for final testing.

PACES

<http://www.fecpractice.com/?p=PACES>

The following comments were taken directly from their web site.

“The Financial and Economic consulting (FEC) Practice is a section of ERA / AECOM dedicated to assisting clients with making sound investment, financial, and economic decisions concerning their facilities, environmental, and transportation costs. Our clients typically have a long-term stake in their facilities and infrastructure and want to obtain the maximum return on their investment dollars.

PACES is used by federal agencies and private-sector companies to develop budgetary facility and site work construction, renovation, and life cycle cost estimates.

PACES software is a parametric cost engineering tool used to help plan and budget facility and infrastructure construction and renovation costs. PACES uses pre-engineered model parameters and construction criteria to accurately predict construction costs with limited design information.

In PACES, quantities can be changed at various places within the model to reflect project specific conditions. The use of the parametric models helps avoid errors and omissions that are commonly associated with traditional cost estimating procedures, particularly during planning and early design phases.”

PROS:

- Federal track record, used for many federal projects (including DoD projects)
- Geared towards the type of adaptive reuse projects targeted for this project
- Seems to be geared to projects that haven't been designed yet (no plans and specs)
- Renovation projects are specially targeted
- Has a condition assessment feature that integrates into cost estimation program
- Is compatible with Success Estimator Version 6.6.18
- Parametric cost modeling. Parametric modeling seems to be very useful from the point of view of the projects to be estimated, as that approach is based more on areas than a lot of specific line items.

CONS:

- Does not appear to have readily updateable cost data, although a new version is supposed to be coming out in the next month or two
- Does not have as widespread a user group as some of the other programs (but a pro is that a large part of its user group is federal agencies)

Decision:

We may need to download and try the free on-line sample version for a week. They have specific mention of renovation work capabilities and a large federal agency user group.

Addendum submitted by

Douglass C. Reed

Appendix E: LEED Point Calculation Detail

Attached, are print-outs for each of the 18 LEED Point calculations for new construction and modernization Project Alternatives.

Table III-5. LEED Certification: FTBL 001 All Project Alternatives

| Category | 02 | 03 | 04 | Maximum Points |
|-------------------------------|----------------------------------|-------------------------------|--------------------------------|-----------------------|
| | Demo and New Construction | Modernization with HPS | Modernization with ATRP | |
| Sustainable Sites | 11 | 11 | 11 | 26 |
| Water Efficiency | 2 | 2 | 2 | 10 |
| Energy and Atmosphere | 19 | 21 | 21 | 35 |
| Materials and Resources | 4 | 9 | 9 | 14 |
| Indoor Environmental Quality | 14 | 13 | 13 | 15 |
| Innovation and Design Process | 1 | 1 | 1 | 6 |
| Regional Priority Credits | 1 | 1 | 1 | 4 |
| Total | 52 | 58 | 58 | 110 |
| Certification Level | Silver | Silver | Silver | NA |

Sources: Center for Resource Solutions; Comfort Design; BAE Urban Economics, 2012.

LEED 2009 for New Construction and Major Renovations

Fort Bliss Building 001-02

Project Checklist

11 3 12 Sustainable Sites Possible Points: 26

| Y | ? | N | | | |
|---|---|---|------------|--|---|
| Y | | | Prereq 1 | Construction Activity Pollution Prevention | |
| 1 | - | - | Credit 1 | Site Selection | 1 |
| - | - | 5 | Credit 2 | Development Density and Community Connectivity | 5 |
| - | - | 1 | Credit 3 | Brownfield Redevelopment | 1 |
| - | - | 6 | Credit 4.1 | Alternative Transportation—Public Transportation Access | 6 |
| 1 | - | - | Credit 4.2 | Alternative Transportation—Bicycle Storage and Changing Rooms | 1 |
| 3 | - | - | Credit 4.3 | Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicle | 3 |
| 2 | - | - | Credit 4.4 | Alternative Transportation—Parking Capacity | 2 |
| 1 | - | - | Credit 5.1 | Site Development—Protect or Restore Habitat | 1 |
| 1 | - | - | Credit 5.2 | Site Development—Maximize Open Space | 1 |
| 1 | - | - | Credit 6.1 | Stormwater Design—Quantity Control | 1 |
| - | 1 | - | Credit 6.2 | Stormwater Design—Quality Control | 1 |
| - | 1 | - | Credit 7.1 | Heat Island Effect—Non-roof | 1 |
| - | 1 | - | Credit 7.2 | Heat Island Effect—Roof | 1 |
| 1 | - | - | Credit 8 | Light Pollution Reduction | 1 |

2 6 0 Water Efficiency Possible Points: 10

| Y | ? | N | | | |
|---|---|---|----------|------------------------------------|--------|
| Y | | | Prereq 1 | Water Use Reduction—20% Reduction | |
| - | 4 | - | Credit 1 | Water Efficient Landscaping | 2 to 4 |
| - | 2 | - | Credit 2 | Innovative Wastewater Technologies | 2 |
| 2 | - | - | Credit 3 | Water Use Reduction | 2 to 4 |

19 9 0 Energy and Atmosphere Possible Points: 35

| Y | ? | N | | | |
|----|---|---|----------|--|---------|
| Y | | | Prereq 1 | Fundamental Commissioning of Building Energy Systems | |
| Y | | | Prereq 2 | Minimum Energy Performance | 0 |
| Y | | | Prereq 3 | Fundamental Refrigerant Management | |
| 15 | - | - | Credit 1 | Optimize Energy Performance | 1 to 19 |
| 4 | - | - | Credit 2 | On-Site Renewable Energy | 1 to 7 |
| - | 2 | - | Credit 3 | Enhanced Commissioning | 2 |
| - | 2 | - | Credit 4 | Enhanced Refrigerant Management | 2 |
| - | 3 | - | Credit 5 | Measurement and Verification | 3 |
| - | 2 | - | Credit 6 | Green Power | 2 |

4 2 12 Materials and Resources Possible Points: 14

| Y | ? | N | | | |
|---|---|---|------------|---|--------|
| Y | | | Prereq 1 | Storage and Collection of Recyclables | 0 |
| - | - | 3 | Credit 1.1 | Building Reuse—Maintain Existing Walls, Floors, and Roof | 1 to 3 |
| - | - | 3 | Credit 1.2 | Building Reuse—Maintain 50% of Interior Non-Structural Elements | 1 |
| - | - | 3 | Credit 2 | Construction Waste Management | 1 to 2 |
| - | - | 3 | Credit 3 | Materials Reuse | 1 to 2 |

Materials and Resources, Continued

| Y | ? | N | | | |
|---|---|---|----------|-----------------------------|--------|
| 2 | - | - | Credit 4 | Recycled Content | 1 to 2 |
| 2 | - | - | Credit 5 | Regional Materials | 1 to 2 |
| - | 1 | - | Credit 6 | Rapidly Renewable Materials | 1 |
| - | 1 | - | Credit 7 | Certified Wood | 1 |

14 1 0 Indoor Environmental Quality Possible Points: 15

| Y | ? | N | | | |
|---|---|---|------------|--|---|
| Y | | | Prereq 1 | Minimum Indoor Air Quality Performance | 0 |
| Y | | | Prereq 2 | Environmental Tobacco Smoke (ETS) Control | 0 |
| 1 | - | - | Credit 1 | Outdoor Air Delivery Monitoring | 1 |
| 1 | - | - | Credit 2 | Increased Ventilation | 1 |
| 1 | - | - | Credit 3.1 | Construction IAQ Management Plan—During Construction | 1 |
| 1 | - | - | Credit 3.2 | Construction IAQ Management Plan—Before Occupancy | 1 |
| 1 | - | - | Credit 4.1 | Low-Emitting Materials—Adhesives and Sealants | 1 |
| 1 | - | - | Credit 4.2 | Low-Emitting Materials—Paints and Coatings | 1 |
| 1 | - | - | Credit 4.3 | Low-Emitting Materials—Flooring Systems | 1 |
| 1 | - | - | Credit 4.4 | Low-Emitting Materials—Composite Wood and Agrifiber Products | 1 |
| 1 | - | - | Credit 5 | Indoor Chemical and Pollutant Source Control | 1 |
| 1 | - | - | Credit 6.1 | Controllability of Systems—Lighting | 1 |
| 1 | - | - | Credit 6.2 | Controllability of Systems—Thermal Comfort | 1 |
| - | 1 | - | Credit 7.1 | Thermal Comfort—Design | 1 |
| 1 | - | - | Credit 7.2 | Thermal Comfort—Verification | 1 |
| 1 | - | - | Credit 8.1 | Daylight and Views—Daylight | 1 |
| 1 | - | - | Credit 8.2 | Daylight and Views—Views | 1 |

1 0 5 Innovation and Design Process Possible Points: 6

| Y | ? | N | | | |
|---|---|---|------------|--------------------------------------|---|
| - | - | 1 | Credit 1.1 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.2 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.3 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.4 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.5 | Innovation in Design: Specific Title | 1 |
| 1 | - | - | Credit 2 | LEED Accredited Professional | 1 |

1 0 0 Regional Priority Credits Possible Points: 4

| Y | ? | N | | | |
|---|---|---|------------|------------------------------------|---|
| 1 | - | - | Credit 1.1 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.2 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.3 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.4 | Regional Priority: Specific Credit | 1 |

52 21 29 Total Possible Points: 110

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110



LEED 2009 for New Construction and Major Renovations

Project Checklist

Fort Bliss Building 001-03

11 3 12 Sustainable Sites Possible Points: 26

| Y | ? | N | | | |
|---|---|---|------------|--|---|
| Y | | | Prereq 1 | Construction Activity Pollution Prevention | |
| 1 | - | - | Credit 1 | Site Selection | 1 |
| - | - | 5 | Credit 2 | Development Density and Community Connectivity | 5 |
| - | - | 1 | Credit 3 | Brownfield Redevelopment | 1 |
| - | - | 6 | Credit 4.1 | Alternative Transportation—Public Transportation Access | 6 |
| 1 | - | - | Credit 4.2 | Alternative Transportation—Bicycle Storage and Changing Rooms | 1 |
| 3 | - | - | Credit 4.3 | Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicle | 3 |
| 2 | - | - | Credit 4.4 | Alternative Transportation—Parking Capacity | 2 |
| 1 | - | - | Credit 5.1 | Site Development—Protect or Restore Habitat | 1 |
| 1 | - | - | Credit 5.2 | Site Development—Maximize Open Space | 1 |
| 1 | - | - | Credit 6.1 | Stormwater Design—Quantity Control | 1 |
| - | 1 | - | Credit 6.2 | Stormwater Design—Quality Control | 1 |
| - | 1 | - | Credit 7.1 | Heat Island Effect—Non-roof | 1 |
| - | 1 | - | Credit 7.2 | Heat Island Effect—Roof | 1 |
| 1 | - | - | Credit 8 | Light Pollution Reduction | 1 |

2 6 0 Water Efficiency Possible Points: 10

| Y | ? | N | | | |
|---|---|---|----------|------------------------------------|--------|
| | | | Prereq 1 | Water Use Reduction—20% Reduction | |
| - | 4 | - | Credit 1 | Water Efficient Landscaping | 2 to 4 |
| - | 2 | - | Credit 2 | Innovative Wastewater Technologies | 2 |
| 2 | - | - | Credit 3 | Water Use Reduction | 2 to 4 |

21 9 0 Energy and Atmosphere Possible Points: 35

| Y | ? | N | | | |
|----|---|---|----------|--|---------|
| Y | | | Prereq 1 | Fundamental Commissioning of Building Energy Systems | |
| Y | | | Prereq 2 | Minimum Energy Performance | 0 |
| Y | | | Prereq 3 | Fundamental Refrigerant Management | |
| 17 | - | - | Credit 1 | Optimize Energy Performance | 1 to 19 |
| 4 | - | - | Credit 2 | On-Site Renewable Energy | 1 to 7 |
| - | 2 | - | Credit 3 | Enhanced Commissioning | 2 |
| - | 2 | - | Credit 4 | Enhanced Refrigerant Management | 2 |
| - | 3 | - | Credit 5 | Measurement and Verification | 3 |
| - | 2 | - | Credit 6 | Green Power | 2 |

9 5 0 Materials and Resources Possible Points: 14

| Y | ? | N | | | |
|---|---|---|------------|---|--------|
| | | | Prereq 1 | Storage and Collection of Recyclables | 0 |
| 3 | - | - | Credit 1.1 | Building Reuse—Maintain Existing Walls, Floors, and Roof | 1 to 3 |
| - | 1 | - | Credit 1.2 | Building Reuse—Maintain 50% of Interior Non-Structural Elements | 1 |
| - | 2 | - | Credit 2 | Construction Waste Management | 1 to 2 |
| 2 | - | - | Credit 3 | Materials Reuse | 1 to 2 |

Materials and Resources, Continued

| Y | ? | N | | | |
|---|---|---|----------|-----------------------------|--------|
| 2 | - | - | Credit 4 | Recycled Content | 1 to 2 |
| 2 | - | - | Credit 5 | Regional Materials | 1 to 2 |
| - | 1 | - | Credit 6 | Rapidly Renewable Materials | 1 |
| - | 1 | - | Credit 7 | Certified Wood | 1 |

13 2 0 Indoor Environmental Quality Possible Points: 15

| Y | ? | N | | | |
|---|---|---|------------|--|---|
| | | | Prereq 1 | Minimum Indoor Air Quality Performance | 0 |
| Y | | | Prereq 2 | Environmental Tobacco Smoke (ETS) Control | 0 |
| 1 | - | - | Credit 1 | Outdoor Air Delivery Monitoring | 1 |
| 1 | - | - | Credit 2 | Increased Ventilation | 1 |
| 1 | - | - | Credit 3.1 | Construction IAQ Management Plan—During Construction | 1 |
| 1 | - | - | Credit 3.2 | Construction IAQ Management Plan—Before Occupancy | 1 |
| 1 | - | - | Credit 4.1 | Low-Emitting Materials—Adhesives and Sealants | 1 |
| 1 | - | - | Credit 4.2 | Low-Emitting Materials—Paints and Coatings | 1 |
| 1 | - | - | Credit 4.3 | Low-Emitting Materials—Flooring Systems | 1 |
| 1 | - | - | Credit 4.4 | Low-Emitting Materials—Composite Wood and Agrifiber Products | 1 |
| 1 | - | - | Credit 5 | Indoor Chemical and Pollutant Source Control | 1 |
| 1 | - | - | Credit 6.1 | Controllability of Systems—Lighting | 1 |
| 1 | - | - | Credit 6.2 | Controllability of Systems—Thermal Comfort | 1 |
| - | 1 | - | Credit 7.1 | Thermal Comfort—Design | 1 |
| 1 | - | - | Credit 7.2 | Thermal Comfort—Verification | 1 |
| 1 | - | - | Credit 8.1 | Daylight and Views—Daylight | 1 |
| - | 1 | - | Credit 8.2 | Daylight and Views—Views | 1 |

1 0 5 Innovation and Design Process Possible Points: 6

| Y | ? | N | | | |
|---|---|---|------------|--------------------------------------|---|
| - | - | 1 | Credit 1.1 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.2 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.3 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.4 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.5 | Innovation in Design: Specific Title | 1 |
| 1 | - | - | Credit 2 | LEED Accredited Professional | 1 |

1 0 0 Regional Priority Credits Possible Points: 4

| Y | ? | N | | | |
|---|---|---|------------|------------------------------------|---|
| 1 | - | - | Credit 1.1 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.2 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.3 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.4 | Regional Priority: Specific Credit | 1 |

58 25 17 Total Possible Points: 110

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110



LEED 2009 for New Construction and Major Renovations

Project Checklist

Fort Bliss Building 001-04

11 3 12 Sustainable Sites Possible Points: 26

| Y | ? | N | | | |
|---|---|---|------------|--|---|
| Y | | | Prereq 1 | Construction Activity Pollution Prevention | |
| 1 | - | - | Credit 1 | Site Selection | 1 |
| - | - | 5 | Credit 2 | Development Density and Community Connectivity | 5 |
| - | - | 1 | Credit 3 | Brownfield Redevelopment | 1 |
| - | - | 6 | Credit 4.1 | Alternative Transportation—Public Transportation Access | 6 |
| 1 | - | - | Credit 4.2 | Alternative Transportation—Bicycle Storage and Changing Rooms | 1 |
| 3 | - | - | Credit 4.3 | Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicle 3 | 3 |
| 2 | - | - | Credit 4.4 | Alternative Transportation—Parking Capacity | 2 |
| 1 | - | - | Credit 5.1 | Site Development—Protect or Restore Habitat | 1 |
| 1 | - | - | Credit 5.2 | Site Development—Maximize Open Space | 1 |
| 1 | - | - | Credit 6.1 | Stormwater Design—Quantity Control | 1 |
| - | 1 | - | Credit 6.2 | Stormwater Design—Quality Control | 1 |
| - | 1 | - | Credit 7.1 | Heat Island Effect—Non-roof | 1 |
| - | 1 | - | Credit 7.2 | Heat Island Effect—Roof | 1 |
| 1 | - | - | Credit 8 | Light Pollution Reduction | 1 |

2 6 0 Water Efficiency Possible Points: 10

| Y | ? | N | | | |
|---|---|---|----------|------------------------------------|--------|
| Y | | | Prereq 1 | Water Use Reduction—20% Reduction | |
| - | 4 | - | Credit 1 | Water Efficient Landscaping | 2 to 4 |
| - | 2 | - | Credit 2 | Innovative Wastewater Technologies | 2 |
| 2 | - | - | Credit 3 | Water Use Reduction | 2 to 4 |

21 9 0 Energy and Atmosphere Possible Points: 35

| Y | ? | N | | | |
|----|---|---|----------|--|---------|
| Y | | | Prereq 1 | Fundamental Commissioning of Building Energy Systems | |
| Y | | | Prereq 2 | Minimum Energy Performance | 0 |
| Y | | | Prereq 3 | Fundamental Refrigerant Management | |
| 17 | - | - | Credit 1 | Optimize Energy Performance | 1 to 19 |
| 4 | - | - | Credit 2 | On-Site Renewable Energy | 1 to 7 |
| - | 2 | - | Credit 3 | Enhanced Commissioning | 2 |
| - | 2 | - | Credit 4 | Enhanced Refrigerant Management | 2 |
| - | 3 | - | Credit 5 | Measurement and Verification | 3 |
| - | 2 | - | Credit 6 | Green Power | 2 |

9 5 0 Materials and Resources Possible Points: 14

| Y | ? | N | | | |
|---|---|---|------------|---|--------|
| Y | | | Prereq 1 | Storage and Collection of Recyclables | 0 |
| 3 | - | - | Credit 1.1 | Building Reuse—Maintain Existing Walls, Floors, and Roof | 1 to 3 |
| - | 1 | - | Credit 1.2 | Building Reuse—Maintain 50% of Interior Non-Structural Elements | 1 |
| - | 2 | - | Credit 2 | Construction Waste Management | 1 to 2 |
| 2 | - | - | Credit 3 | Materials Reuse | 1 to 2 |

Materials and Resources, Continued

| Y | ? | N | | | |
|---|---|---|----------|-----------------------------|--------|
| 2 | - | - | Credit 4 | Recycled Content | 1 to 2 |
| 2 | - | - | Credit 5 | Regional Materials | 1 to 2 |
| - | 1 | - | Credit 6 | Rapidly Renewable Materials | 1 |
| - | 1 | - | Credit 7 | Certified Wood | 1 |

13 2 0 Indoor Environmental Quality Possible Points: 15

| Y | ? | N | | | |
|---|---|---|------------|--|---|
| Y | | | Prereq 1 | Minimum Indoor Air Quality Performance | 0 |
| Y | | | Prereq 2 | Environmental Tobacco Smoke (ETS) Control | 0 |
| 1 | - | - | Credit 1 | Outdoor Air Delivery Monitoring | 1 |
| 1 | - | - | Credit 2 | Increased Ventilation | 1 |
| 1 | - | - | Credit 3.1 | Construction IAQ Management Plan—During Construction | 1 |
| 1 | - | - | Credit 3.2 | Construction IAQ Management Plan—Before Occupancy | 1 |
| 1 | - | - | Credit 4.1 | Low-Emitting Materials—Adhesives and Sealants | 1 |
| 1 | - | - | Credit 4.2 | Low-Emitting Materials—Paints and Coatings | 1 |
| 1 | - | - | Credit 4.3 | Low-Emitting Materials—Flooring Systems | 1 |
| 1 | - | - | Credit 4.4 | Low-Emitting Materials—Composite Wood and Agrifiber Products | 1 |
| 1 | - | - | Credit 5 | Indoor Chemical and Pollutant Source Control | 1 |
| 1 | - | - | Credit 6.1 | Controllability of Systems—Lighting | 1 |
| 1 | - | - | Credit 6.2 | Controllability of Systems—Thermal Comfort | 1 |
| - | 1 | - | Credit 7.1 | Thermal Comfort—Design | 1 |
| 1 | - | - | Credit 7.2 | Thermal Comfort—Verification | 1 |
| 1 | - | - | Credit 8.1 | Daylight and Views—Daylight | 1 |
| - | 1 | - | Credit 8.2 | Daylight and Views—Views | 1 |

1 0 5 Innovation and Design Process Possible Points: 6

| Y | ? | N | | | |
|---|---|---|------------|--------------------------------------|---|
| - | - | 1 | Credit 1.1 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.2 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.3 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.4 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.5 | Innovation in Design: Specific Title | 1 |
| 1 | - | - | Credit 2 | LEED Accredited Professional | 1 |

1 0 0 Regional Priority Credits Possible Points: 4

| Y | ? | N | | | |
|---|---|---|------------|------------------------------------|---|
| 1 | - | - | Credit 1.1 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.2 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.3 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.4 | Regional Priority: Specific Credit | 1 |

58 25 17 Total Possible Points: 110

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110

Table III-11 LEED Certification: FTBL 115 All Project Alternatives

| Category | 02 Demo and New Construction | 03 Modernization with HPS | 04 Modernization with ATRP | Maximum Points |
|-------------------------------|---|--|---|---------------------------|
| Sustainable Sites | 11 | 11 | 11 | 26 |
| Water Efficiency | 2 | 2 | 2 | 10 |
| Energy and Atmosphere | 19 | 17 | 17 | 35 |
| Materials and Resources | 4 | 9 | 9 | 14 |
| Indoor Environmental Quality | 14 | 13 | 13 | 15 |
| Innovation and Design Process | 1 | 1 | 1 | 6 |
| Regional Priority Credits | 1 | 1 | 1 | 4 |
| Total | 52 | 54 | 54 | 110 |
| Certification Level | Silver | Silver | Silver | NA |

Sources: Center for Resource Solutions; Comfort Design; BAE Urban Economics, 2012.

LEED 2009 for New Construction and Major Renovations

Fort Bliss Building 115-02

Project Checklist

| 11 | 3 | 12 | Sustainable Sites | | Possible Points: 26 |
|----|---|----|-------------------|---|---------------------|
| Y | ? | N | | | |
| Y | | | Prereq 1 | Construction Activity Pollution Prevention | |
| 1 | - | - | Credit 1 | Site Selection | 1 |
| - | - | 5 | Credit 2 | Development Density and Community Connectivity | 5 |
| - | - | 1 | Credit 3 | Brownfield Redevelopment | 1 |
| - | - | 6 | Credit 4.1 | Alternative Transportation—Public Transportation Access | 6 |
| 1 | - | - | Credit 4.2 | Alternative Transportation—Bicycle Storage and Changing Rooms | 1 |
| 3 | - | - | Credit 4.3 | Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles | 3 |
| 2 | - | - | Credit 4.4 | Alternative Transportation—Parking Capacity | 2 |
| 1 | - | - | Credit 5.1 | Site Development—Protect or Restore Habitat | 1 |
| 1 | - | - | Credit 5.2 | Site Development—Maximize Open Space | 1 |
| 1 | - | - | Credit 6.1 | Stormwater Design—Quantity Control | 1 |
| - | 1 | - | Credit 6.2 | Stormwater Design—Quality Control | 1 |
| - | 1 | - | Credit 7.1 | Heat Island Effect—Non-roof | 1 |
| - | 1 | - | Credit 7.2 | Heat Island Effect—Roof | 1 |
| 1 | - | - | Credit 8 | Light Pollution Reduction | 1 |

| 2 | 6 | 0 | Water Efficiency | | Possible Points: 10 |
|---|---|---|------------------|------------------------------------|---------------------|
| Y | ? | N | | | |
| Y | | | Prereq 1 | Water Use Reduction—20% Reduction | |
| - | 4 | - | Credit 1 | Water Efficient Landscaping | 2 to 4 |
| - | 2 | - | Credit 2 | Innovative Wastewater Technologies | 2 |
| 2 | - | - | Credit 3 | Water Use Reduction | 2 to 4 |

| 19 | 9 | 0 | Energy and Atmosphere | | Possible Points: 35 |
|----|---|---|-----------------------|--|---------------------|
| Y | ? | N | | | |
| Y | | | Prereq 1 | Fundamental Commissioning of Building Energy Systems | |
| Y | | | Prereq 2 | Minimum Energy Performance | 0 |
| Y | | | Prereq 3 | Fundamental Refrigerant Management | |
| 15 | - | - | Credit 1 | Optimize Energy Performance | 1 to 19 |
| 4 | - | - | Credit 2 | On-Site Renewable Energy | 1 to 7 |
| - | 2 | - | Credit 3 | Enhanced Commissioning | 2 |
| - | 2 | - | Credit 4 | Enhanced Refrigerant Management | 2 |
| - | 3 | - | Credit 5 | Measurement and Verification | 3 |
| - | 2 | - | Credit 6 | Green Power | 2 |

| 4 | 2 | 12 | Materials and Resources | | Possible Points: 14 |
|---|---|----|-------------------------|---|---------------------|
| Y | ? | N | | | |
| Y | | | Prereq 1 | Storage and Collection of Recyclables | 0 |
| - | - | 3 | Credit 1.1 | Building Reuse—Maintain Existing Walls, Floors, and Roof | 1 to 3 |
| - | - | 3 | Credit 1.2 | Building Reuse—Maintain 50% of Interior Non-Structural Elements | 1 |
| - | - | 3 | Credit 2 | Construction Waste Management | 1 to 2 |
| - | - | 3 | Credit 3 | Materials Reuse | 1 to 2 |

| | | | Materials and Resources, Continued | | |
|---|---|---|------------------------------------|-----------------------------|--------|
| Y | ? | N | | | |
| 2 | - | - | Credit 4 | Recycled Content | 1 to 2 |
| 2 | - | - | Credit 5 | Regional Materials | 1 to 2 |
| - | 1 | - | Credit 6 | Rapidly Renewable Materials | 1 |
| - | 1 | - | Credit 7 | Certified Wood | 1 |

| 14 | 1 | 0 | Indoor Environmental Quality | | Possible Points: 15 |
|----|---|---|------------------------------|--|---------------------|
| Y | ? | N | | | |
| Y | | | Prereq 1 | Minimum Indoor Air Quality Performance | 0 |
| Y | | | Prereq 2 | Environmental Tobacco Smoke (ETS) Control | 0 |
| 1 | - | - | Credit 1 | Outdoor Air Delivery Monitoring | 1 |
| 1 | - | - | Credit 2 | Increased Ventilation | 1 |
| 1 | - | - | Credit 3.1 | Construction IAQ Management Plan—During Construction | 1 |
| 1 | - | - | Credit 3.2 | Construction IAQ Management Plan—Before Occupancy | 1 |
| 1 | - | - | Credit 4.1 | Low-Emitting Materials—Adhesives and Sealants | 1 |
| 1 | - | - | Credit 4.2 | Low-Emitting Materials—Paints and Coatings | 1 |
| 1 | - | - | Credit 4.3 | Low-Emitting Materials—Flooring Systems | 1 |
| 1 | - | - | Credit 4.4 | Low-Emitting Materials—Composite Wood and Agrifiber Products | 1 |
| 1 | - | - | Credit 5 | Indoor Chemical and Pollutant Source Control | 1 |
| 1 | - | - | Credit 6.1 | Controllability of Systems—Lighting | 1 |
| 1 | - | - | Credit 6.2 | Controllability of Systems—Thermal Comfort | 1 |
| - | 1 | - | Credit 7.1 | Thermal Comfort—Design | 1 |
| 1 | - | - | Credit 7.2 | Thermal Comfort—Verification | 1 |
| 1 | - | - | Credit 8.1 | Daylight and Views—Daylight | 1 |
| 1 | - | - | Credit 8.2 | Daylight and Views—Views | 1 |

| 1 | 0 | 5 | Innovation and Design Process | | Possible Points: 6 |
|---|---|---|-------------------------------|--------------------------------------|--------------------|
| Y | ? | N | | | |
| - | - | 1 | Credit 1.1 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.2 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.3 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.4 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.5 | Innovation in Design: Specific Title | 1 |
| 1 | - | - | Credit 2 | LEED Accredited Professional | 1 |

| 1 | 0 | 0 | Regional Priority Credits | | Possible Points: 4 |
|---|---|---|---------------------------|------------------------------------|--------------------|
| Y | ? | N | | | |
| 1 | - | - | Credit 1.1 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.2 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.3 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.4 | Regional Priority: Specific Credit | 1 |

| 52 | 21 | 29 | Total | | Possible Points: 110 |
|----|----|----|-------|--|----------------------|
|----|----|----|-------|--|----------------------|

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110



LEED 2009 for New Construction and Major Renovations

Fort Bliss Building 115-03

Project Checklist

11 3 12 Sustainable Sites Possible Points: 26

| Y | ? | N | | | |
|---|---|---|------------|--|---|
| Y | | | Prereq 1 | Construction Activity Pollution Prevention | |
| 1 | - | - | Credit 1 | Site Selection | 1 |
| - | - | 5 | Credit 2 | Development Density and Community Connectivity | 5 |
| - | - | 1 | Credit 3 | Brownfield Redevelopment | 1 |
| - | - | 6 | Credit 4.1 | Alternative Transportation—Public Transportation Access | 6 |
| 1 | - | - | Credit 4.2 | Alternative Transportation—Bicycle Storage and Changing Rooms | 1 |
| 3 | - | - | Credit 4.3 | Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicle | 3 |
| 2 | - | - | Credit 4.4 | Alternative Transportation—Parking Capacity | 2 |
| 1 | - | - | Credit 5.1 | Site Development—Protect or Restore Habitat | 1 |
| 1 | - | - | Credit 5.2 | Site Development—Maximize Open Space | 1 |
| 1 | - | - | Credit 6.1 | Stormwater Design—Quantity Control | 1 |
| - | 1 | - | Credit 6.2 | Stormwater Design—Quality Control | 1 |
| - | 1 | - | Credit 7.1 | Heat Island Effect—Non-roof | 1 |
| - | 1 | - | Credit 7.2 | Heat Island Effect—Roof | 1 |
| 1 | - | - | Credit 8 | Light Pollution Reduction | 1 |

2 6 0 Water Efficiency Possible Points: 10

| Y | ? | N | | | |
|---|---|---|----------|------------------------------------|--------|
| Y | | | Prereq 1 | Water Use Reduction—20% Reduction | |
| - | 4 | - | Credit 1 | Water Efficient Landscaping | 2 to 4 |
| - | 2 | - | Credit 2 | Innovative Wastewater Technologies | 2 |
| 2 | - | - | Credit 3 | Water Use Reduction | 2 to 4 |

17 9 0 Energy and Atmosphere Possible Points: 35

| Y | ? | N | | | |
|----|---|---|----------|--|---------|
| Y | | | Prereq 1 | Fundamental Commissioning of Building Energy Systems | |
| Y | | | Prereq 2 | Minimum Energy Performance | 0 |
| Y | | | Prereq 3 | Fundamental Refrigerant Management | |
| 13 | - | - | Credit 1 | Optimize Energy Performance | 1 to 19 |
| 4 | - | - | Credit 2 | On-Site Renewable Energy | 1 to 7 |
| - | 2 | - | Credit 3 | Enhanced Commissioning | 2 |
| - | 2 | - | Credit 4 | Enhanced Refrigerant Management | 2 |
| - | 3 | - | Credit 5 | Measurement and Verification | 3 |
| - | 2 | - | Credit 6 | Green Power | 2 |

9 5 0 Materials and Resources Possible Points: 14

| Y | ? | N | | | |
|---|---|---|------------|---|--------|
| Y | | | Prereq 1 | Storage and Collection of Recyclables | 0 |
| 3 | - | - | Credit 1.1 | Building Reuse—Maintain Existing Walls, Floors, and Roof | 1 to 3 |
| - | 1 | - | Credit 1.2 | Building Reuse—Maintain 50% of Interior Non-Structural Elements | 1 |
| - | 2 | - | Credit 2 | Construction Waste Management | 1 to 2 |
| 2 | - | - | Credit 3 | Materials Reuse | 1 to 2 |

Materials and Resources, Continued

| Y | ? | N | | | |
|---|---|---|----------|-----------------------------|--------|
| 2 | - | - | Credit 4 | Recycled Content | 1 to 2 |
| 2 | - | - | Credit 5 | Regional Materials | 1 to 2 |
| - | 1 | - | Credit 6 | Rapidly Renewable Materials | 1 |
| - | 1 | - | Credit 7 | Certified Wood | 1 |

13 2 0 Indoor Environmental Quality Possible Points: 15

| Y | ? | N | | | |
|---|---|---|------------|--|---|
| Y | | | Prereq 1 | Minimum Indoor Air Quality Performance | 0 |
| Y | | | Prereq 2 | Environmental Tobacco Smoke (ETS) Control | 0 |
| 1 | - | - | Credit 1 | Outdoor Air Delivery Monitoring | 1 |
| 1 | - | - | Credit 2 | Increased Ventilation | 1 |
| 1 | - | - | Credit 3.1 | Construction IAQ Management Plan—During Construction | 1 |
| 1 | - | - | Credit 3.2 | Construction IAQ Management Plan—Before Occupancy | 1 |
| 1 | - | - | Credit 4.1 | Low-Emitting Materials—Adhesives and Sealants | 1 |
| 1 | - | - | Credit 4.2 | Low-Emitting Materials—Paints and Coatings | 1 |
| 1 | - | - | Credit 4.3 | Low-Emitting Materials—Flooring Systems | 1 |
| 1 | - | - | Credit 4.4 | Low-Emitting Materials—Composite Wood and Agrifiber Products | 1 |
| 1 | - | - | Credit 5 | Indoor Chemical and Pollutant Source Control | 1 |
| 1 | - | - | Credit 6.1 | Controllability of Systems—Lighting | 1 |
| 1 | - | - | Credit 6.2 | Controllability of Systems—Thermal Comfort | 1 |
| - | 1 | - | Credit 7.1 | Thermal Comfort—Design | 1 |
| 1 | - | - | Credit 7.2 | Thermal Comfort—Verification | 1 |
| 1 | - | - | Credit 8.1 | Daylight and Views—Daylight | 1 |
| - | 1 | - | Credit 8.2 | Daylight and Views—Views | 1 |

1 0 5 Innovation and Design Process Possible Points: 6

| Y | ? | N | | | |
|---|---|---|------------|--------------------------------------|---|
| - | - | 1 | Credit 1.1 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.2 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.3 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.4 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.5 | Innovation in Design: Specific Title | 1 |
| 1 | - | - | Credit 2 | LEED Accredited Professional | 1 |

1 0 0 Regional Priority Credits Possible Points: 4

| Y | ? | N | | | |
|---|---|---|------------|------------------------------------|---|
| 1 | - | - | Credit 1.1 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.2 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.3 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.4 | Regional Priority: Specific Credit | 1 |

54 25 17 Total Possible Points: 110

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110



LEED 2009 for New Construction and Major Renovations

Project Checklist

Fort Bliss Building 115-04

11 3 12 Sustainable Sites Possible Points: 26

| Y | ? | N | | | |
|---|---|---|------------|---|---|
| Y | | | Prereq 1 | Construction Activity Pollution Prevention | |
| 1 | - | - | Credit 1 | Site Selection | 1 |
| - | - | 5 | Credit 2 | Development Density and Community Connectivity | 5 |
| - | - | 1 | Credit 3 | Brownfield Redevelopment | 1 |
| - | - | 6 | Credit 4.1 | Alternative Transportation—Public Transportation Access | 6 |
| 1 | - | - | Credit 4.2 | Alternative Transportation—Bicycle Storage and Changing Rooms | 1 |
| 3 | - | - | Credit 4.3 | Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles | 3 |
| 2 | - | - | Credit 4.4 | Alternative Transportation—Parking Capacity | 2 |
| 1 | - | - | Credit 5.1 | Site Development—Protect or Restore Habitat | 1 |
| 1 | - | - | Credit 5.2 | Site Development—Maximize Open Space | 1 |
| 1 | - | - | Credit 6.1 | Stormwater Design—Quantity Control | 1 |
| - | 1 | - | Credit 6.2 | Stormwater Design—Quality Control | 1 |
| - | 1 | - | Credit 7.1 | Heat Island Effect—Non-roof | 1 |
| - | 1 | - | Credit 7.2 | Heat Island Effect—Roof | 1 |
| 1 | - | - | Credit 8 | Light Pollution Reduction | 1 |

2 6 0 Water Efficiency Possible Points: 10

| Y | ? | N | | | |
|---|---|---|----------|------------------------------------|--------|
| Y | | | Prereq 1 | Water Use Reduction—20% Reduction | |
| - | 4 | - | Credit 1 | Water Efficient Landscaping | 2 to 4 |
| - | 2 | - | Credit 2 | Innovative Wastewater Technologies | 2 |
| 2 | - | - | Credit 3 | Water Use Reduction | 2 to 4 |

17 9 0 Energy and Atmosphere Possible Points: 35

| Y | ? | N | | | |
|----|---|---|----------|--|---------|
| Y | | | Prereq 1 | Fundamental Commissioning of Building Energy Systems | |
| Y | | | Prereq 2 | Minimum Energy Performance | 0 |
| Y | | | Prereq 3 | Fundamental Refrigerant Management | |
| 13 | - | - | Credit 1 | Optimize Energy Performance | 1 to 19 |
| 4 | - | - | Credit 2 | On-Site Renewable Energy | 1 to 7 |
| - | 2 | - | Credit 3 | Enhanced Commissioning | 2 |
| - | 2 | - | Credit 4 | Enhanced Refrigerant Management | 2 |
| - | 3 | - | Credit 5 | Measurement and Verification | 3 |
| - | 2 | - | Credit 6 | Green Power | 2 |

9 5 0 Materials and Resources Possible Points: 14

| Y | ? | N | | | |
|---|---|---|------------|---|--------|
| Y | | | Prereq 1 | Storage and Collection of Recyclables | 0 |
| 3 | - | - | Credit 1.1 | Building Reuse—Maintain Existing Walls, Floors, and Roof | 1 to 3 |
| - | 1 | - | Credit 1.2 | Building Reuse—Maintain 50% of Interior Non-Structural Elements | 1 |
| - | 2 | - | Credit 2 | Construction Waste Management | 1 to 2 |
| 2 | - | - | Credit 3 | Materials Reuse | 1 to 2 |

Materials and Resources, Continued

| Y | ? | N | | | |
|---|---|---|----------|-----------------------------|--------|
| 2 | - | - | Credit 4 | Recycled Content | 1 to 2 |
| 2 | - | - | Credit 5 | Regional Materials | 1 to 2 |
| - | 1 | - | Credit 6 | Rapidly Renewable Materials | 1 |
| - | 1 | - | Credit 7 | Certified Wood | 1 |

13 2 0 Indoor Environmental Quality Possible Points: 15

| Y | ? | N | | | |
|---|---|---|------------|--|---|
| Y | | | Prereq 1 | Minimum Indoor Air Quality Performance | 0 |
| Y | | | Prereq 2 | Environmental Tobacco Smoke (ETS) Control | 0 |
| 1 | - | - | Credit 1 | Outdoor Air Delivery Monitoring | 1 |
| 1 | - | - | Credit 2 | Increased Ventilation | 1 |
| 1 | - | - | Credit 3.1 | Construction IAQ Management Plan—During Construction | 1 |
| 1 | - | - | Credit 3.2 | Construction IAQ Management Plan—Before Occupancy | 1 |
| 1 | - | - | Credit 4.1 | Low-Emitting Materials—Adhesives and Sealants | 1 |
| 1 | - | - | Credit 4.2 | Low-Emitting Materials—Paints and Coatings | 1 |
| 1 | - | - | Credit 4.3 | Low-Emitting Materials—Flooring Systems | 1 |
| 1 | - | - | Credit 4.4 | Low-Emitting Materials—Composite Wood and Agrifiber Products | 1 |
| 1 | - | - | Credit 5 | Indoor Chemical and Pollutant Source Control | 1 |
| 1 | - | - | Credit 6.1 | Controllability of Systems—Lighting | 1 |
| 1 | - | - | Credit 6.2 | Controllability of Systems—Thermal Comfort | 1 |
| - | 1 | - | Credit 7.1 | Thermal Comfort—Design | 1 |
| 1 | - | - | Credit 7.2 | Thermal Comfort—Verification | 1 |
| 1 | - | - | Credit 8.1 | Daylight and Views—Daylight | 1 |
| - | 1 | - | Credit 8.2 | Daylight and Views—Views | 1 |

1 0 5 Innovation and Design Process Possible Points: 6

| Y | ? | N | | | |
|---|---|---|------------|--------------------------------------|---|
| - | - | 1 | Credit 1.1 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.2 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.3 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.4 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.5 | Innovation in Design: Specific Title | 1 |
| 1 | - | - | Credit 2 | LEED Accredited Professional | 1 |

1 0 0 Regional Priority Credits Possible Points: 4

| Y | ? | N | | | |
|---|---|---|------------|------------------------------------|---|
| 1 | - | - | Credit 1.1 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.2 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.3 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.4 | Regional Priority: Specific Credit | 1 |

54 25 17 Total Possible Points: 110

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110

Table III-19 LEED Certification: SJCA 061 All Project Alternatives

| Category | 02 Demo and New Construction | 03 Modernization with HPS | 04 Modernization with AT/FP | Maximum Points |
|-------------------------------|---|--|--|---------------------------|
| Sustainable Sites | 11 | 11 | 11 | 26 |
| Water Efficiency | 2 | 2 | 2 | 10 |
| Energy and Atmosphere | 20 | 22 | 22 | 35 |
| Materials and Resources | 4 | 9 | 9 | 14 |
| Indoor Environmental Quality | 14 | 13 | 13 | 15 |
| Innovation and Design Process | 1 | 1 | 1 | 6 |
| Regional Priority Credits | 1 | 1 | 1 | 4 |
| Total | 53 | 59 | 59 | 110 |
| Certification Level | Silver | Silver | Silver | NA |

Sources: Center for Resource Solutions; Comfort Design; BAE Urban Economics, 2012.



LEED 2009 for New Construction and Major Renovations

Project Checklist

Saint Juliens Creek Annex Building 61-02

11 3 12 Sustainable Sites Possible Points: 26

| Y | ? | N | | | |
|---|---|---|------------|---|---|
| Y | | | Prereq 1 | Construction Activity Pollution Prevention | |
| 1 | - | - | Credit 1 | Site Selection | 1 |
| - | - | 5 | Credit 2 | Development Density and Community Connectivity | 5 |
| - | - | 1 | Credit 3 | Brownfield Redevelopment | 1 |
| - | - | 6 | Credit 4.1 | Alternative Transportation—Public Transportation Access | 6 |
| 1 | - | - | Credit 4.2 | Alternative Transportation—Bicycle Storage and Changing Rooms | 1 |
| 3 | - | - | Credit 4.3 | Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles | 3 |
| 2 | - | - | Credit 4.4 | Alternative Transportation—Parking Capacity | 2 |
| 1 | - | - | Credit 5.1 | Site Development—Protect or Restore Habitat | 1 |
| 1 | - | - | Credit 5.2 | Site Development—Maximize Open Space | 1 |
| 1 | - | - | Credit 6.1 | Stormwater Design—Quantity Control | 1 |
| - | 1 | - | Credit 6.2 | Stormwater Design—Quality Control | 1 |
| - | 1 | - | Credit 7.1 | Heat Island Effect—Non-roof | 1 |
| - | 1 | - | Credit 7.2 | Heat Island Effect—Roof | 1 |
| 1 | - | - | Credit 8 | Light Pollution Reduction | 1 |

2 6 0 Water Efficiency Possible Points: 10

| Y | ? | N | | | |
|---|---|---|----------|------------------------------------|--------|
| Y | | | Prereq 1 | Water Use Reduction—20% Reduction | |
| - | 4 | - | Credit 1 | Water Efficient Landscaping | 2 to 4 |
| - | 2 | - | Credit 2 | Innovative Wastewater Technologies | 2 |
| 2 | - | - | Credit 3 | Water Use Reduction | 2 to 4 |

20 9 0 Energy and Atmosphere Possible Points: 35

| Y | ? | N | | | |
|----|---|---|----------|--|---------|
| Y | | | Prereq 1 | Fundamental Commissioning of Building Energy Systems | |
| Y | | | Prereq 2 | Minimum Energy Performance | 0 |
| Y | | | Prereq 3 | Fundamental Refrigerant Management | |
| 15 | - | - | Credit 1 | Optimize Energy Performance | 1 to 19 |
| 5 | - | - | Credit 2 | On-Site Renewable Energy | 1 to 7 |
| - | 2 | - | Credit 3 | Enhanced Commissioning | 2 |
| - | 2 | - | Credit 4 | Enhanced Refrigerant Management | 2 |
| - | 3 | - | Credit 5 | Measurement and Verification | 3 |
| - | 2 | - | Credit 6 | Green Power | 2 |

4 2 12 Materials and Resources Possible Points: 14

| Y | ? | N | | | |
|---|---|---|------------|---|--------|
| Y | | | Prereq 1 | Storage and Collection of Recyclables | 0 |
| - | - | 3 | Credit 1.1 | Building Reuse—Maintain Existing Walls, Floors, and Roof | 1 to 3 |
| - | - | 3 | Credit 1.2 | Building Reuse—Maintain 50% of Interior Non-Structural Elements | 1 |
| - | - | 3 | Credit 2 | Construction Waste Management | 1 to 2 |
| - | - | 3 | Credit 3 | Materials Reuse | 1 to 2 |

Materials and Resources, Continued

| Y | ? | N | | | |
|---|---|---|----------|-----------------------------|--------|
| 2 | - | - | Credit 4 | Recycled Content | 1 to 2 |
| 2 | - | - | Credit 5 | Regional Materials | 1 to 2 |
| - | 1 | - | Credit 6 | Rapidly Renewable Materials | 1 |
| - | 1 | - | Credit 7 | Certified Wood | 1 |

14 1 0 Indoor Environmental Quality Possible Points: 15

| Y | ? | N | | | |
|---|---|---|------------|--|---|
| Y | | | Prereq 1 | Minimum Indoor Air Quality Performance | 0 |
| Y | | | Prereq 2 | Environmental Tobacco Smoke (ETS) Control | 0 |
| 1 | - | - | Credit 1 | Outdoor Air Delivery Monitoring | 1 |
| 1 | - | - | Credit 2 | Increased Ventilation | 1 |
| 1 | - | - | Credit 3.1 | Construction IAQ Management Plan—During Construction | 1 |
| 1 | - | - | Credit 3.2 | Construction IAQ Management Plan—Before Occupancy | 1 |
| 1 | - | - | Credit 4.1 | Low-Emitting Materials—Adhesives and Sealants | 1 |
| 1 | - | - | Credit 4.2 | Low-Emitting Materials—Paints and Coatings | 1 |
| 1 | - | - | Credit 4.3 | Low-Emitting Materials—Flooring Systems | 1 |
| 1 | - | - | Credit 4.4 | Low-Emitting Materials—Composite Wood and Agrifiber Products | 1 |
| 1 | - | - | Credit 5 | Indoor Chemical and Pollutant Source Control | 1 |
| 1 | - | - | Credit 6.1 | Controllability of Systems—Lighting | 1 |
| 1 | - | - | Credit 6.2 | Controllability of Systems—Thermal Comfort | 1 |
| - | 1 | - | Credit 7.1 | Thermal Comfort—Design | 1 |
| 1 | - | - | Credit 7.2 | Thermal Comfort—Verification | 1 |
| 1 | - | - | Credit 8.1 | Daylight and Views—Daylight | 1 |
| 1 | - | - | Credit 8.2 | Daylight and Views—Views | 1 |

1 0 5 Innovation and Design Process Possible Points: 6

| Y | ? | N | | | |
|---|---|---|------------|--------------------------------------|---|
| - | - | 1 | Credit 1.1 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.2 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.3 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.4 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.5 | Innovation in Design: Specific Title | 1 |
| 1 | - | - | Credit 2 | LEED Accredited Professional | 1 |

1 0 0 Regional Priority Credits Possible Points: 4

| Y | ? | N | | | |
|---|---|---|------------|------------------------------------|---|
| 1 | - | - | Credit 1.1 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.2 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.3 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.4 | Regional Priority: Specific Credit | 1 |

53 21 29 Total Possible Points: 110

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110



LEED 2009 for New Construction and Major Renovations

Project Checklist

Saint Juliens Creek Annex Building 61-03

11 3 12 Sustainable Sites Possible Points: 26

| Y | ? | N | | | |
|---|---|---|------------|--|---|
| Y | | | Prereq 1 | Construction Activity Pollution Prevention | |
| 1 | - | - | Credit 1 | Site Selection | 1 |
| - | - | 5 | Credit 2 | Development Density and Community Connectivity | 5 |
| - | - | 1 | Credit 3 | Brownfield Redevelopment | 1 |
| - | - | 6 | Credit 4.1 | Alternative Transportation—Public Transportation Access | 6 |
| 1 | - | - | Credit 4.2 | Alternative Transportation—Bicycle Storage and Changing Rooms | 1 |
| 3 | - | - | Credit 4.3 | Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicle | 3 |
| 2 | - | - | Credit 4.4 | Alternative Transportation—Parking Capacity | 2 |
| 1 | - | - | Credit 5.1 | Site Development—Protect or Restore Habitat | 1 |
| 1 | - | - | Credit 5.2 | Site Development—Maximize Open Space | 1 |
| 1 | - | - | Credit 6.1 | Stormwater Design—Quantity Control | 1 |
| - | 1 | - | Credit 6.2 | Stormwater Design—Quality Control | 1 |
| - | 1 | - | Credit 7.1 | Heat Island Effect—Non-roof | 1 |
| - | 1 | - | Credit 7.2 | Heat Island Effect—Roof | 1 |
| 1 | - | - | Credit 8 | Light Pollution Reduction | 1 |

2 6 0 Water Efficiency Possible Points: 10

| Y | ? | N | | | |
|---|---|---|----------|------------------------------------|--------|
| Y | | | Prereq 1 | Water Use Reduction—20% Reduction | |
| - | 4 | - | Credit 1 | Water Efficient Landscaping | 2 to 4 |
| - | 2 | - | Credit 2 | Innovative Wastewater Technologies | 2 |
| 2 | - | - | Credit 3 | Water Use Reduction | 2 to 4 |

22 9 0 Energy and Atmosphere Possible Points: 35

| Y | ? | N | | | |
|----|---|---|----------|--|---------|
| Y | | | Prereq 1 | Fundamental Commissioning of Building Energy Systems | |
| Y | | | Prereq 2 | Minimum Energy Performance | 0 |
| Y | | | Prereq 3 | Fundamental Refrigerant Management | |
| 17 | - | - | Credit 1 | Optimize Energy Performance | 1 to 19 |
| 5 | - | - | Credit 2 | On-Site Renewable Energy | 1 to 7 |
| - | 2 | - | Credit 3 | Enhanced Commissioning | 2 |
| - | 2 | - | Credit 4 | Enhanced Refrigerant Management | 2 |
| - | 3 | - | Credit 5 | Measurement and Verification | 3 |
| - | 2 | - | Credit 6 | Green Power | 2 |

9 5 0 Materials and Resources Possible Points: 14

| Y | ? | N | | | |
|---|---|---|------------|---|--------|
| Y | | | Prereq 1 | Storage and Collection of Recyclables | 0 |
| 3 | - | - | Credit 1.1 | Building Reuse—Maintain Existing Walls, Floors, and Roof | 1 to 3 |
| - | 1 | - | Credit 1.2 | Building Reuse—Maintain 50% of Interior Non-Structural Elements | 1 |
| - | 2 | - | Credit 2 | Construction Waste Management | 1 to 2 |
| 2 | - | - | Credit 3 | Materials Reuse | 1 to 2 |

Materials and Resources, Continued

| Y | ? | N | | | |
|---|---|---|----------|-----------------------------|--------|
| 2 | - | - | Credit 4 | Recycled Content | 1 to 2 |
| 2 | - | - | Credit 5 | Regional Materials | 1 to 2 |
| - | 1 | - | Credit 6 | Rapidly Renewable Materials | 1 |
| - | 1 | - | Credit 7 | Certified Wood | 1 |

13 2 0 Indoor Environmental Quality Possible Points: 15

| Y | ? | N | | | |
|---|---|---|------------|--|---|
| Y | | | Prereq 1 | Minimum Indoor Air Quality Performance | 0 |
| Y | | | Prereq 2 | Environmental Tobacco Smoke (ETS) Control | 0 |
| 1 | - | - | Credit 1 | Outdoor Air Delivery Monitoring | 1 |
| 1 | - | - | Credit 2 | Increased Ventilation | 1 |
| 1 | - | - | Credit 3.1 | Construction IAQ Management Plan—During Construction | 1 |
| 1 | - | - | Credit 3.2 | Construction IAQ Management Plan—Before Occupancy | 1 |
| 1 | - | - | Credit 4.1 | Low-Emitting Materials—Adhesives and Sealants | 1 |
| 1 | - | - | Credit 4.2 | Low-Emitting Materials—Paints and Coatings | 1 |
| 1 | - | - | Credit 4.3 | Low-Emitting Materials—Flooring Systems | 1 |
| 1 | - | - | Credit 4.4 | Low-Emitting Materials—Composite Wood and Agrifiber Products | 1 |
| 1 | - | - | Credit 5 | Indoor Chemical and Pollutant Source Control | 1 |
| 1 | - | - | Credit 6.1 | Controllability of Systems—Lighting | 1 |
| 1 | - | - | Credit 6.2 | Controllability of Systems—Thermal Comfort | 1 |
| - | 1 | - | Credit 7.1 | Thermal Comfort—Design | 1 |
| 1 | - | - | Credit 7.2 | Thermal Comfort—Verification | 1 |
| 1 | - | - | Credit 8.1 | Daylight and Views—Daylight | 1 |
| - | 1 | - | Credit 8.2 | Daylight and Views—Views | 1 |

1 0 5 Innovation and Design Process Possible Points: 6

| Y | ? | N | | | |
|---|---|---|------------|--------------------------------------|---|
| - | - | 1 | Credit 1.1 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.2 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.3 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.4 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.5 | Innovation in Design: Specific Title | 1 |
| 1 | - | - | Credit 2 | LEED Accredited Professional | 1 |

1 0 0 Regional Priority Credits Possible Points: 4

| Y | ? | N | | | |
|---|---|---|------------|------------------------------------|---|
| 1 | - | - | Credit 1.1 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.2 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.3 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.4 | Regional Priority: Specific Credit | 1 |

59 25 17 Total Possible Points: 110

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110



LEED 2009 for New Construction and Major Renovations
Project Checklist

Saint Juliens Creek Annex Building 61-04

11 3 12 Sustainable Sites Possible Points: 26

| Y | ? | N | | | |
|---|---|---|------------|---|---|
| Y | | | Prereq 1 | Construction Activity Pollution Prevention | |
| 1 | - | - | Credit 1 | Site Selection | 1 |
| - | - | 5 | Credit 2 | Development Density and Community Connectivity | 5 |
| - | - | 1 | Credit 3 | Brownfield Redevelopment | 1 |
| - | - | 6 | Credit 4.1 | Alternative Transportation—Public Transportation Access | 6 |
| 1 | - | - | Credit 4.2 | Alternative Transportation—Bicycle Storage and Changing Rooms | 1 |
| 3 | - | - | Credit 4.3 | Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles | 3 |
| 2 | - | - | Credit 4.4 | Alternative Transportation—Parking Capacity | 2 |
| 1 | - | - | Credit 5.1 | Site Development—Protect or Restore Habitat | 1 |
| 1 | - | - | Credit 5.2 | Site Development—Maximize Open Space | 1 |
| 1 | - | - | Credit 6.1 | Stormwater Design—Quantity Control | 1 |
| - | 1 | - | Credit 6.2 | Stormwater Design—Quality Control | 1 |
| - | 1 | - | Credit 7.1 | Heat Island Effect—Non-roof | 1 |
| - | 1 | - | Credit 7.2 | Heat Island Effect—Roof | 1 |
| 1 | - | - | Credit 8 | Light Pollution Reduction | 1 |

2 6 0 Water Efficiency Possible Points: 10

| Y | ? | N | | | |
|---|---|---|----------|------------------------------------|--------|
| Y | | | Prereq 1 | Water Use Reduction—20% Reduction | |
| - | 4 | - | Credit 1 | Water Efficient Landscaping | 2 to 4 |
| - | 2 | - | Credit 2 | Innovative Wastewater Technologies | 2 |
| 2 | - | - | Credit 3 | Water Use Reduction | 2 to 4 |

22 9 0 Energy and Atmosphere Possible Points: 35

| Y | ? | N | | | |
|----|---|---|----------|--|---------|
| Y | | | Prereq 1 | Fundamental Commissioning of Building Energy Systems | |
| Y | | | Prereq 2 | Minimum Energy Performance | 0 |
| Y | | | Prereq 3 | Fundamental Refrigerant Management | |
| 17 | - | - | Credit 1 | Optimize Energy Performance | 1 to 19 |
| 5 | - | - | Credit 2 | On-Site Renewable Energy | 1 to 7 |
| - | 2 | - | Credit 3 | Enhanced Commissioning | 2 |
| - | 2 | - | Credit 4 | Enhanced Refrigerant Management | 2 |
| - | 3 | - | Credit 5 | Measurement and Verification | 3 |
| - | 2 | - | Credit 6 | Green Power | 2 |

9 5 0 Materials and Resources Possible Points: 14

| Y | ? | N | | | |
|---|---|---|------------|---|--------|
| Y | | | Prereq 1 | Storage and Collection of Recyclables | 0 |
| 3 | - | - | Credit 1.1 | Building Reuse—Maintain Existing Walls, Floors, and Roof | 1 to 3 |
| - | 1 | - | Credit 1.2 | Building Reuse—Maintain 50% of Interior Non-Structural Elements | 1 |
| - | 2 | - | Credit 2 | Construction Waste Management | 1 to 2 |
| 2 | - | - | Credit 3 | Materials Reuse | 1 to 2 |

Materials and Resources, Continued

| Y | ? | N | | | |
|---|---|---|----------|-----------------------------|--------|
| 2 | - | - | Credit 4 | Recycled Content | 1 to 2 |
| 2 | - | - | Credit 5 | Regional Materials | 1 to 2 |
| - | 1 | - | Credit 6 | Rapidly Renewable Materials | 1 |
| - | 1 | - | Credit 7 | Certified Wood | 1 |

13 2 0 Indoor Environmental Quality Possible Points: 15

| Y | ? | N | | | |
|---|---|---|------------|--|---|
| Y | | | Prereq 1 | Minimum Indoor Air Quality Performance | 0 |
| Y | | | Prereq 2 | Environmental Tobacco Smoke (ETS) Control | 0 |
| 1 | - | - | Credit 1 | Outdoor Air Delivery Monitoring | 1 |
| 1 | - | - | Credit 2 | Increased Ventilation | 1 |
| 1 | - | - | Credit 3.1 | Construction IAQ Management Plan—During Construction | 1 |
| 1 | - | - | Credit 3.2 | Construction IAQ Management Plan—Before Occupancy | 1 |
| 1 | - | - | Credit 4.1 | Low-Emitting Materials—Adhesives and Sealants | 1 |
| 1 | - | - | Credit 4.2 | Low-Emitting Materials—Paints and Coatings | 1 |
| 1 | - | - | Credit 4.3 | Low-Emitting Materials—Flooring Systems | 1 |
| 1 | - | - | Credit 4.4 | Low-Emitting Materials—Composite Wood and Agrifiber Products | 1 |
| 1 | - | - | Credit 5 | Indoor Chemical and Pollutant Source Control | 1 |
| 1 | - | - | Credit 6.1 | Controllability of Systems—Lighting | 1 |
| 1 | - | - | Credit 6.2 | Controllability of Systems—Thermal Comfort | 1 |
| - | 1 | - | Credit 7.1 | Thermal Comfort—Design | 1 |
| 1 | - | - | Credit 7.2 | Thermal Comfort—Verification | 1 |
| 1 | - | - | Credit 8.1 | Daylight and Views—Daylight | 1 |
| - | 1 | - | Credit 8.2 | Daylight and Views—Views | 1 |

1 0 5 Innovation and Design Process Possible Points: 6

| Y | ? | N | | | |
|---|---|---|------------|--------------------------------------|---|
| - | - | 1 | Credit 1.1 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.2 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.3 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.4 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.5 | Innovation in Design: Specific Title | 1 |
| 1 | - | - | Credit 2 | LEED Accredited Professional | 1 |

1 0 0 Regional Priority Credits Possible Points: 4

| Y | ? | N | | | |
|---|---|---|------------|------------------------------------|---|
| 1 | - | - | Credit 1.1 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.2 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.3 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.4 | Regional Priority: Specific Credit | 1 |

59 25 17 Total Possible Points: 110

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110

Table III-27 LEED Certification: SJCA 168 All Project Alternatives

| Category | 02 Demo and new Construction | 03 modernization with HPS | 04 modernization with AT/FP | maximum Points |
|-------------------------------|---|--|--|---------------------------|
| Sustainable Sites | 11 | 11 | 11 | 26 |
| Water Efficiency | 2 | 2 | 2 | 10 |
| Energy and Atmosphere | 20 | 22 | 22 | 35 |
| Materials and Resources | 4 | 9 | 9 | 14 |
| Indoor Environmental Quality | 14 | 13 | 13 | 15 |
| Innovation and Design Process | 1 | 1 | 1 | 6 |
| Regional Priority Credits | 1 | 1 | 1 | 4 |
| Total | 53 | 59 | 59 | 110 |
| Certification Level | Silver | Silver | Silver | NA |

Sources: Center for Resource Solutions; Comfort Design; BAE Urban Economics, 2012.



LEED 2009 for New Construction and Major Renovations

Project Checklist

Saint Juliens Creek Annex Building 168-02

11 3 12 Sustainable Sites Possible Points: 26

| Y | ? | N | | | |
|---|---|---|------------|--|---|
| Y | | | Prereq 1 | Construction Activity Pollution Prevention | |
| 1 | - | - | Credit 1 | Site Selection | 1 |
| - | - | 5 | Credit 2 | Development Density and Community Connectivity | 5 |
| - | - | 1 | Credit 3 | Brownfield Redevelopment | 1 |
| - | - | 6 | Credit 4.1 | Alternative Transportation—Public Transportation Access | 6 |
| 1 | - | - | Credit 4.2 | Alternative Transportation—Bicycle Storage and Changing Rooms | 1 |
| 3 | - | - | Credit 4.3 | Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicle 3 | |
| 2 | - | - | Credit 4.4 | Alternative Transportation—Parking Capacity | 2 |
| 1 | - | - | Credit 5.1 | Site Development—Protect or Restore Habitat | 1 |
| 1 | - | - | Credit 5.2 | Site Development—Maximize Open Space | 1 |
| 1 | - | - | Credit 6.1 | Stormwater Design—Quantity Control | 1 |
| - | 1 | - | Credit 6.2 | Stormwater Design—Quality Control | 1 |
| - | 1 | - | Credit 7.1 | Heat Island Effect—Non-roof | 1 |
| - | 1 | - | Credit 7.2 | Heat Island Effect—Roof | 1 |
| 1 | - | - | Credit 8 | Light Pollution Reduction | 1 |

2 6 0 Water Efficiency Possible Points: 10

| Y | ? | N | | | |
|---|---|---|----------|------------------------------------|--------|
| | | | Prereq 1 | Water Use Reduction—20% Reduction | |
| - | 4 | - | Credit 1 | Water Efficient Landscaping | 2 to 4 |
| - | 2 | - | Credit 2 | Innovative Wastewater Technologies | 2 |
| 2 | - | - | Credit 3 | Water Use Reduction | 2 to 4 |

20 9 0 Energy and Atmosphere Possible Points: 35

| Y | ? | N | | | |
|----|---|---|----------|--|---------|
| Y | | | Prereq 1 | Fundamental Commissioning of Building Energy Systems | |
| Y | | | Prereq 2 | Minimum Energy Performance | 0 |
| Y | | | Prereq 3 | Fundamental Refrigerant Management | |
| 15 | - | - | Credit 1 | Optimize Energy Performance | 1 to 19 |
| 5 | - | - | Credit 2 | On-Site Renewable Energy | 1 to 7 |
| - | 2 | - | Credit 3 | Enhanced Commissioning | 2 |
| - | 2 | - | Credit 4 | Enhanced Refrigerant Management | 2 |
| - | 3 | - | Credit 5 | Measurement and Verification | 3 |
| - | 2 | - | Credit 6 | Green Power | 2 |

4 2 12 Materials and Resources Possible Points: 14

| Y | ? | N | | | |
|---|---|---|------------|---|--------|
| Y | | | Prereq 1 | Storage and Collection of Recyclables | 0 |
| - | - | 3 | Credit 1.1 | Building Reuse—Maintain Existing Walls, Floors, and Roof | 1 to 3 |
| - | - | 3 | Credit 1.2 | Building Reuse—Maintain 50% of Interior Non-Structural Elements | 1 |
| - | - | 3 | Credit 2 | Construction Waste Management | 1 to 2 |
| - | - | 3 | Credit 3 | Materials Reuse | 1 to 2 |

Materials and Resources, Continued

| Y | ? | N | | | |
|---|---|---|----------|-----------------------------|--------|
| 2 | - | - | Credit 4 | Recycled Content | 1 to 2 |
| 2 | - | - | Credit 5 | Regional Materials | 1 to 2 |
| - | 1 | - | Credit 6 | Rapidly Renewable Materials | 1 |
| - | 1 | - | Credit 7 | Certified Wood | 1 |

14 1 0 Indoor Environmental Quality Possible Points: 15

| Y | ? | N | | | |
|---|---|---|------------|--|---|
| Y | | | Prereq 1 | Minimum Indoor Air Quality Performance | 0 |
| Y | | | Prereq 2 | Environmental Tobacco Smoke (ETS) Control | 0 |
| 1 | - | - | Credit 1 | Outdoor Air Delivery Monitoring | 1 |
| 1 | - | - | Credit 2 | Increased Ventilation | 1 |
| 1 | - | - | Credit 3.1 | Construction IAQ Management Plan—During Construction | 1 |
| 1 | - | - | Credit 3.2 | Construction IAQ Management Plan—Before Occupancy | 1 |
| 1 | - | - | Credit 4.1 | Low-Emitting Materials—Adhesives and Sealants | 1 |
| 1 | - | - | Credit 4.2 | Low-Emitting Materials—Paints and Coatings | 1 |
| 1 | - | - | Credit 4.3 | Low-Emitting Materials—Flooring Systems | 1 |
| 1 | - | - | Credit 4.4 | Low-Emitting Materials—Composite Wood and Agrifiber Products | 1 |
| 1 | - | - | Credit 5 | Indoor Chemical and Pollutant Source Control | 1 |
| 1 | - | - | Credit 6.1 | Controllability of Systems—Lighting | 1 |
| 1 | - | - | Credit 6.2 | Controllability of Systems—Thermal Comfort | 1 |
| - | 1 | - | Credit 7.1 | Thermal Comfort—Design | 1 |
| 1 | - | - | Credit 7.2 | Thermal Comfort—Verification | 1 |
| 1 | - | - | Credit 8.1 | Daylight and Views—Daylight | 1 |
| 1 | - | - | Credit 8.2 | Daylight and Views—Views | 1 |

1 0 5 Innovation and Design Process Possible Points: 6

| Y | ? | N | | | |
|---|---|---|------------|--------------------------------------|---|
| - | - | 1 | Credit 1.1 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.2 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.3 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.4 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.5 | Innovation in Design: Specific Title | 1 |
| 1 | - | - | Credit 2 | LEED Accredited Professional | 1 |

1 0 0 Regional Priority Credits Possible Points: 4

| Y | ? | N | | | |
|---|---|---|------------|------------------------------------|---|
| 1 | - | - | Credit 1.1 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.2 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.3 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.4 | Regional Priority: Specific Credit | 1 |

53 21 29 Total Possible Points: 110

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110



LEED 2009 for New Construction and Major Renovations

Project Checklist

Saint Juliens Creek Annex Building 168-03

11 3 12 Sustainable Sites Possible Points: 26

| Y | ? | N | | | |
|---|---|---|------------|---|---|
| Y | | | Prereq 1 | Construction Activity Pollution Prevention | |
| 1 | - | - | Credit 1 | Site Selection | 1 |
| - | - | 5 | Credit 2 | Development Density and Community Connectivity | 5 |
| - | - | 1 | Credit 3 | Brownfield Redevelopment | 1 |
| - | - | 6 | Credit 4.1 | Alternative Transportation—Public Transportation Access | 6 |
| 1 | - | - | Credit 4.2 | Alternative Transportation—Bicycle Storage and Changing Rooms | 1 |
| 3 | - | - | Credit 4.3 | Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles | 3 |
| 2 | - | - | Credit 4.4 | Alternative Transportation—Parking Capacity | 2 |
| 1 | - | - | Credit 5.1 | Site Development—Protect or Restore Habitat | 1 |
| 1 | - | - | Credit 5.2 | Site Development—Maximize Open Space | 1 |
| 1 | - | - | Credit 6.1 | Stormwater Design—Quantity Control | 1 |
| - | 1 | - | Credit 6.2 | Stormwater Design—Quality Control | 1 |
| - | 1 | - | Credit 7.1 | Heat Island Effect—Non-roof | 1 |
| - | 1 | - | Credit 7.2 | Heat Island Effect—Roof | 1 |
| 1 | - | - | Credit 8 | Light Pollution Reduction | 1 |

2 6 0 Water Efficiency Possible Points: 10

| Y | ? | N | | | |
|---|---|---|----------|------------------------------------|--------|
| | | | Prereq 1 | Water Use Reduction—20% Reduction | |
| - | 4 | - | Credit 1 | Water Efficient Landscaping | 2 to 4 |
| - | 2 | - | Credit 2 | Innovative Wastewater Technologies | 2 |
| 2 | - | - | Credit 3 | Water Use Reduction | 2 to 4 |

22 9 0 Energy and Atmosphere Possible Points: 35

| Y | ? | N | | | |
|----|---|---|----------|--|---------|
| Y | | | Prereq 1 | Fundamental Commissioning of Building Energy Systems | |
| Y | | | Prereq 2 | Minimum Energy Performance | 0 |
| Y | | | Prereq 3 | Fundamental Refrigerant Management | |
| 17 | - | - | Credit 1 | Optimize Energy Performance | 1 to 19 |
| 5 | - | - | Credit 2 | On-Site Renewable Energy | 1 to 7 |
| - | 2 | - | Credit 3 | Enhanced Commissioning | 2 |
| - | 2 | - | Credit 4 | Enhanced Refrigerant Management | 2 |
| - | 3 | - | Credit 5 | Measurement and Verification | 3 |
| - | 2 | - | Credit 6 | Green Power | 2 |

9 5 0 Materials and Resources Possible Points: 14

| Y | ? | N | | | |
|---|---|---|------------|---|--------|
| | | | Prereq 1 | Storage and Collection of Recyclables | 0 |
| 3 | - | - | Credit 1.1 | Building Reuse—Maintain Existing Walls, Floors, and Roof | 1 to 3 |
| - | 1 | - | Credit 1.2 | Building Reuse—Maintain 50% of Interior Non-Structural Elements | 1 |
| - | 2 | - | Credit 2 | Construction Waste Management | 1 to 2 |
| 2 | - | - | Credit 3 | Materials Reuse | 1 to 2 |

Materials and Resources, Continued

| Y | ? | N | | | |
|---|---|---|----------|-----------------------------|--------|
| 2 | - | - | Credit 4 | Recycled Content | 1 to 2 |
| 2 | - | - | Credit 5 | Regional Materials | 1 to 2 |
| - | 1 | - | Credit 6 | Rapidly Renewable Materials | 1 |
| - | 1 | - | Credit 7 | Certified Wood | 1 |

13 2 0 Indoor Environmental Quality Possible Points: 15

| Y | ? | N | | | |
|---|---|---|------------|--|---|
| Y | | | Prereq 1 | Minimum Indoor Air Quality Performance | 0 |
| Y | | | Prereq 2 | Environmental Tobacco Smoke (ETS) Control | 0 |
| 1 | - | - | Credit 1 | Outdoor Air Delivery Monitoring | 1 |
| 1 | - | - | Credit 2 | Increased Ventilation | 1 |
| 1 | - | - | Credit 3.1 | Construction IAQ Management Plan—During Construction | 1 |
| 1 | - | - | Credit 3.2 | Construction IAQ Management Plan—Before Occupancy | 1 |
| 1 | - | - | Credit 4.1 | Low-Emitting Materials—Adhesives and Sealants | 1 |
| 1 | - | - | Credit 4.2 | Low-Emitting Materials—Paints and Coatings | 1 |
| 1 | - | - | Credit 4.3 | Low-Emitting Materials—Flooring Systems | 1 |
| 1 | - | - | Credit 4.4 | Low-Emitting Materials—Composite Wood and Agrifiber Products | 1 |
| 1 | - | - | Credit 5 | Indoor Chemical and Pollutant Source Control | 1 |
| 1 | - | - | Credit 6.1 | Controllability of Systems—Lighting | 1 |
| 1 | - | - | Credit 6.2 | Controllability of Systems—Thermal Comfort | 1 |
| - | 1 | - | Credit 7.1 | Thermal Comfort—Design | 1 |
| 1 | - | - | Credit 7.2 | Thermal Comfort—Verification | 1 |
| 1 | - | - | Credit 8.1 | Daylight and Views—Daylight | 1 |
| - | 1 | - | Credit 8.2 | Daylight and Views—Views | 1 |

1 0 5 Innovation and Design Process Possible Points: 6

| Y | ? | N | | | |
|---|---|---|------------|--------------------------------------|---|
| - | - | 1 | Credit 1.1 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.2 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.3 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.4 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.5 | Innovation in Design: Specific Title | 1 |
| 1 | - | - | Credit 2 | LEED Accredited Professional | 1 |

1 0 0 Regional Priority Credits Possible Points: 4

| Y | ? | N | | | |
|---|---|---|------------|------------------------------------|---|
| 1 | - | - | Credit 1.1 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.2 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.3 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.4 | Regional Priority: Specific Credit | 1 |

59 25 17 Total Possible Points: 110

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110



LEED 2009 for New Construction and Major Renovations

Project Checklist

Saint Juliens Creek Annex Building 168-04

11 3 12 Sustainable Sites Possible Points: 26

| Y | ? | N | | | |
|---|---|---|------------|---|---|
| Y | | | Prereq 1 | Construction Activity Pollution Prevention | |
| 1 | - | - | Credit 1 | Site Selection | 1 |
| - | - | 5 | Credit 2 | Development Density and Community Connectivity | 5 |
| - | - | 1 | Credit 3 | Brownfield Redevelopment | 1 |
| - | - | 6 | Credit 4.1 | Alternative Transportation—Public Transportation Access | 6 |
| 1 | - | - | Credit 4.2 | Alternative Transportation—Bicycle Storage and Changing Rooms | 1 |
| 3 | - | - | Credit 4.3 | Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles | 3 |
| 2 | - | - | Credit 4.4 | Alternative Transportation—Parking Capacity | 2 |
| 1 | - | - | Credit 5.1 | Site Development—Protect or Restore Habitat | 1 |
| 1 | - | - | Credit 5.2 | Site Development—Maximize Open Space | 1 |
| 1 | - | - | Credit 6.1 | Stormwater Design—Quantity Control | 1 |
| - | 1 | - | Credit 6.2 | Stormwater Design—Quality Control | 1 |
| - | 1 | - | Credit 7.1 | Heat Island Effect—Non-roof | 1 |
| - | 1 | - | Credit 7.2 | Heat Island Effect—Roof | 1 |
| 1 | - | - | Credit 8 | Light Pollution Reduction | 1 |

2 6 0 Water Efficiency Possible Points: 10

| Y | ? | N | | | |
|---|---|---|----------|------------------------------------|--------|
| Y | | | Prereq 1 | Water Use Reduction—20% Reduction | |
| - | 4 | - | Credit 1 | Water Efficient Landscaping | 2 to 4 |
| - | 2 | - | Credit 2 | Innovative Wastewater Technologies | 2 |
| 2 | - | - | Credit 3 | Water Use Reduction | 2 to 4 |

22 9 0 Energy and Atmosphere Possible Points: 35

| Y | ? | N | | | |
|----|---|---|----------|--|---------|
| Y | | | Prereq 1 | Fundamental Commissioning of Building Energy Systems | |
| Y | | | Prereq 2 | Minimum Energy Performance | 0 |
| Y | | | Prereq 3 | Fundamental Refrigerant Management | |
| 17 | - | - | Credit 1 | Optimize Energy Performance | 1 to 19 |
| 5 | - | - | Credit 2 | On-Site Renewable Energy | 1 to 7 |
| - | 2 | - | Credit 3 | Enhanced Commissioning | 2 |
| - | 2 | - | Credit 4 | Enhanced Refrigerant Management | 2 |
| - | 3 | - | Credit 5 | Measurement and Verification | 3 |
| - | 2 | - | Credit 6 | Green Power | 2 |

9 5 0 Materials and Resources Possible Points: 14

| Y | ? | N | | | |
|---|---|---|------------|---|--------|
| Y | | | Prereq 1 | Storage and Collection of Recyclables | 0 |
| 3 | - | - | Credit 1.1 | Building Reuse—Maintain Existing Walls, Floors, and Roof | 1 to 3 |
| - | 1 | - | Credit 1.2 | Building Reuse—Maintain 50% of Interior Non-Structural Elements | 1 |
| - | 2 | - | Credit 2 | Construction Waste Management | 1 to 2 |
| 2 | - | - | Credit 3 | Materials Reuse | 1 to 2 |

Materials and Resources, Continued

| Y | ? | N | | | |
|---|---|---|----------|-----------------------------|--------|
| 2 | - | - | Credit 4 | Recycled Content | 1 to 2 |
| 2 | - | - | Credit 5 | Regional Materials | 1 to 2 |
| - | 1 | - | Credit 6 | Rapidly Renewable Materials | 1 |
| - | 1 | - | Credit 7 | Certified Wood | 1 |

13 2 0 Indoor Environmental Quality Possible Points: 15

| Y | ? | N | | | |
|---|---|---|------------|--|---|
| Y | | | Prereq 1 | Minimum Indoor Air Quality Performance | 0 |
| Y | | | Prereq 2 | Environmental Tobacco Smoke (ETS) Control | 0 |
| 1 | - | - | Credit 1 | Outdoor Air Delivery Monitoring | 1 |
| 1 | - | - | Credit 2 | Increased Ventilation | 1 |
| 1 | - | - | Credit 3.1 | Construction IAQ Management Plan—During Construction | 1 |
| 1 | - | - | Credit 3.2 | Construction IAQ Management Plan—Before Occupancy | 1 |
| 1 | - | - | Credit 4.1 | Low-Emitting Materials—Adhesives and Sealants | 1 |
| 1 | - | - | Credit 4.2 | Low-Emitting Materials—Paints and Coatings | 1 |
| 1 | - | - | Credit 4.3 | Low-Emitting Materials—Flooring Systems | 1 |
| 1 | - | - | Credit 4.4 | Low-Emitting Materials—Composite Wood and Agrifiber Products | 1 |
| 1 | - | - | Credit 5 | Indoor Chemical and Pollutant Source Control | 1 |
| 1 | - | - | Credit 6.1 | Controllability of Systems—Lighting | 1 |
| 1 | - | - | Credit 6.2 | Controllability of Systems—Thermal Comfort | 1 |
| - | 1 | - | Credit 7.1 | Thermal Comfort—Design | 1 |
| 1 | - | - | Credit 7.2 | Thermal Comfort—Verification | 1 |
| 1 | - | - | Credit 8.1 | Daylight and Views—Daylight | 1 |
| - | 1 | - | Credit 8.2 | Daylight and Views—Views | 1 |

1 0 5 Innovation and Design Process Possible Points: 6

| Y | ? | N | | | |
|---|---|---|------------|--------------------------------------|---|
| - | - | 1 | Credit 1.1 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.2 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.3 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.4 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.5 | Innovation in Design: Specific Title | 1 |
| 1 | - | - | Credit 2 | LEED Accredited Professional | 1 |

1 0 0 Regional Priority Credits Possible Points: 4

| Y | ? | N | | | |
|---|---|---|------------|------------------------------------|---|
| 1 | - | - | Credit 1.1 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.2 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.3 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.4 | Regional Priority: Specific Credit | 1 |

59 25 17 Total Possible Points: 110

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110

Table III-35 LEED Certification: FEW 222 All Project Alternatives

| Category | 02 New Construction | 03 Modernization with HPS | 04 Modernization with AT/FP | Maximum Points |
|-------------------------------|------------------------------------|--|--|---------------------------|
| Sustainable Sites | 11 | 11 | 11 | 26 |
| Water Efficiency | 4 | 2 | 2 | 10 |
| Energy and Atmosphere | 15 | 16 | 16 | 35 |
| Materials and Resources | 4 | 9 | 9 | 14 |
| Indoor Environmental Quality | 15 | 13 | 13 | 15 |
| Innovation and Design Process | 1 | 1 | 1 | 6 |
| Regional Priority Credits | 1 | 1 | 1 | 4 |
| Total | 51 | 53 | 53 | 110 |
| Certification Level | Silver | Silver | Silver | NA |

Note: 2009 LEED fro New Construction and Major Renovations Project Checklist

Sources: Center for Resource Solutions; Comfort Design; BAE Urban Economics, 2012.



LEED 2009 for New Construction and Major Renovations

Project Checklist

F.E.Warren Building 222-02

11 3 12 Sustainable Sites Possible Points: 26

| Y | ? | N | | | |
|---|---|---|------------|---|---|
| Y | | | Prereq 1 | Construction Activity Pollution Prevention | |
| 1 | - | - | Credit 1 | Site Selection | 1 |
| - | - | 5 | Credit 2 | Development Density and Community Connectivity | 5 |
| - | - | 1 | Credit 3 | Brownfield Redevelopment | 1 |
| - | - | 6 | Credit 4.1 | Alternative Transportation—Public Transportation Access | 6 |
| 1 | - | - | Credit 4.2 | Alternative Transportation—Bicycle Storage and Changing Rooms | 1 |
| 3 | - | - | Credit 4.3 | Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles | 3 |
| 2 | - | - | Credit 4.4 | Alternative Transportation—Parking Capacity | 2 |
| 1 | - | - | Credit 5.1 | Site Development—Protect or Restore Habitat | 1 |
| 1 | - | - | Credit 5.2 | Site Development—Maximize Open Space | 1 |
| 1 | - | - | Credit 6.1 | Stormwater Design—Quantity Control | 1 |
| - | 1 | - | Credit 6.2 | Stormwater Design—Quality Control | 1 |
| - | 1 | - | Credit 7.1 | Heat Island Effect—Non-roof | 1 |
| - | 1 | - | Credit 7.2 | Heat Island Effect—Roof | 1 |
| 1 | - | - | Credit 8 | Light Pollution Reduction | 1 |

4 6 0 Water Efficiency Possible Points: 10

| Y | ? | N | | | |
|---|---|---|----------|------------------------------------|--------|
| Y | | | Prereq 1 | Water Use Reduction—20% Reduction | |
| - | 4 | - | Credit 1 | Water Efficient Landscaping | 2 to 4 |
| - | 2 | - | Credit 2 | Innovative Wastewater Technologies | 2 |
| 4 | - | - | Credit 3 | Water Use Reduction | 2 to 4 |

15 9 0 Energy and Atmosphere Possible Points: 35

| Y | ? | N | | | |
|----|---|---|----------|--|---------|
| Y | | | Prereq 1 | Fundamental Commissioning of Building Energy Systems | |
| Y | | | Prereq 2 | Minimum Energy Performance | 0 |
| Y | | | Prereq 3 | Fundamental Refrigerant Management | |
| 11 | - | - | Credit 1 | Optimize Energy Performance | 1 to 19 |
| 4 | - | - | Credit 2 | On-Site Renewable Energy | 1 to 7 |
| - | 2 | - | Credit 3 | Enhanced Commissioning | 2 |
| - | 2 | - | Credit 4 | Enhanced Refrigerant Management | 2 |
| - | 3 | - | Credit 5 | Measurement and Verification | 3 |
| - | 2 | - | Credit 6 | Green Power | 2 |

4 2 12 Materials and Resources Possible Points: 14

| Y | ? | N | | | |
|---|---|---|------------|---|--------|
| Y | | | Prereq 1 | Storage and Collection of Recyclables | 0 |
| - | - | 3 | Credit 1.1 | Building Reuse—Maintain Existing Walls, Floors, and Roof | 1 to 3 |
| - | - | 3 | Credit 1.2 | Building Reuse—Maintain 50% of Interior Non-Structural Elements | 1 |
| - | - | 3 | Credit 2 | Construction Waste Management | 1 to 2 |
| - | - | 3 | Credit 3 | Materials Reuse | 1 to 2 |

Materials and Resources, Continued

| Y | ? | N | | | |
|---|---|---|----------|-----------------------------|--------|
| 2 | - | - | Credit 4 | Recycled Content | 1 to 2 |
| 2 | - | - | Credit 5 | Regional Materials | 1 to 2 |
| - | 1 | - | Credit 6 | Rapidly Renewable Materials | 1 |
| - | 1 | - | Credit 7 | Certified Wood | 1 |

15 0 0 Indoor Environmental Quality Possible Points: 15

| Y | ? | N | | | |
|---|---|---|------------|--|---|
| Y | | | Prereq 1 | Minimum Indoor Air Quality Performance | 0 |
| Y | | | Prereq 2 | Environmental Tobacco Smoke (ETS) Control | 0 |
| 1 | - | - | Credit 1 | Outdoor Air Delivery Monitoring | 1 |
| 1 | - | - | Credit 2 | Increased Ventilation | 1 |
| 1 | - | - | Credit 3.1 | Construction IAQ Management Plan—During Construction | 1 |
| 1 | - | - | Credit 3.2 | Construction IAQ Management Plan—Before Occupancy | 1 |
| 1 | - | - | Credit 4.1 | Low-Emitting Materials—Adhesives and Sealants | 1 |
| 1 | - | - | Credit 4.2 | Low-Emitting Materials—Paints and Coatings | 1 |
| 1 | - | - | Credit 4.3 | Low-Emitting Materials—Flooring Systems | 1 |
| 1 | - | - | Credit 4.4 | Low-Emitting Materials—Composite Wood and Agrifiber Products | 1 |
| 1 | - | - | Credit 5 | Indoor Chemical and Pollutant Source Control | 1 |
| 1 | - | - | Credit 6.1 | Controllability of Systems—Lighting | 1 |
| 1 | - | - | Credit 6.2 | Controllability of Systems—Thermal Comfort | 1 |
| 1 | - | - | Credit 7.1 | Thermal Comfort—Design | 1 |
| 1 | - | - | Credit 7.2 | Thermal Comfort—Verification | 1 |
| 1 | - | - | Credit 8.1 | Daylight and Views—Daylight | 1 |
| 1 | - | - | Credit 8.2 | Daylight and Views—Views | 1 |

1 0 5 Innovation and Design Process Possible Points: 6

| Y | ? | N | | | |
|---|---|---|------------|--------------------------------------|---|
| - | - | 1 | Credit 1.1 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.2 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.3 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.4 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.5 | Innovation in Design: Specific Title | 1 |
| 1 | - | - | Credit 2 | LEED Accredited Professional | 1 |

1 0 0 Regional Priority Credits Possible Points: 4

| Y | ? | N | | | |
|---|---|---|------------|------------------------------------|---|
| 1 | - | - | Credit 1.1 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.2 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.3 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.4 | Regional Priority: Specific Credit | 1 |

51 20 29 Total Possible Points: 110

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110



LEED 2009 for New Construction and Major Renovations

Project Checklist

F.E. Warren Building 222-03

11 3 12 Sustainable Sites Possible Points: 26

| Y | ? | N | | | |
|---|---|---|------------|---|---|
| Y | | | Prereq 1 | Construction Activity Pollution Prevention | |
| 1 | - | - | Credit 1 | Site Selection | 1 |
| - | - | 5 | Credit 2 | Development Density and Community Connectivity | 5 |
| - | - | 1 | Credit 3 | Brownfield Redevelopment | 1 |
| - | - | 6 | Credit 4.1 | Alternative Transportation—Public Transportation Access | 6 |
| 1 | - | - | Credit 4.2 | Alternative Transportation—Bicycle Storage and Changing Rooms | 1 |
| 3 | - | - | Credit 4.3 | Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles | 3 |
| 2 | - | - | Credit 4.4 | Alternative Transportation—Parking Capacity | 2 |
| 1 | - | - | Credit 5.1 | Site Development—Protect or Restore Habitat | 1 |
| 1 | - | - | Credit 5.2 | Site Development—Maximize Open Space | 1 |
| 1 | - | - | Credit 6.1 | Stormwater Design—Quantity Control | 1 |
| - | 1 | - | Credit 6.2 | Stormwater Design—Quality Control | 1 |
| - | 1 | - | Credit 7.1 | Heat Island Effect—Non-roof | 1 |
| - | 1 | - | Credit 7.2 | Heat Island Effect—Roof | 1 |
| 1 | - | - | Credit 8 | Light Pollution Reduction | 1 |

2 6 0 Water Efficiency Possible Points: 10

| Y | ? | N | | | |
|---|---|---|----------|------------------------------------|--------|
| Y | | | Prereq 1 | Water Use Reduction—20% Reduction | |
| - | 4 | - | Credit 1 | Water Efficient Landscaping | 2 to 4 |
| - | 2 | - | Credit 2 | Innovative Wastewater Technologies | 2 |
| 2 | - | - | Credit 3 | Water Use Reduction | 2 to 4 |

16 9 0 Energy and Atmosphere Possible Points: 35

| Y | ? | N | | | |
|----|---|---|----------|--|---------|
| Y | | | Prereq 1 | Fundamental Commissioning of Building Energy Systems | |
| Y | | | Prereq 2 | Minimum Energy Performance | 0 |
| Y | | | Prereq 3 | Fundamental Refrigerant Management | |
| 12 | - | - | Credit 1 | Optimize Energy Performance | 1 to 19 |
| 4 | - | - | Credit 2 | On-Site Renewable Energy | 1 to 7 |
| - | 2 | - | Credit 3 | Enhanced Commissioning | 2 |
| - | 2 | - | Credit 4 | Enhanced Refrigerant Management | 2 |
| - | 3 | - | Credit 5 | Measurement and Verification | 3 |
| - | 2 | - | Credit 6 | Green Power | 2 |

9 5 0 Materials and Resources Possible Points: 14

| Y | ? | N | | | |
|---|---|---|------------|---|--------|
| Y | | | Prereq 1 | Storage and Collection of Recyclables | 0 |
| 3 | - | - | Credit 1.1 | Building Reuse—Maintain Existing Walls, Floors, and Roof | 1 to 3 |
| - | 1 | - | Credit 1.2 | Building Reuse—Maintain 50% of Interior Non-Structural Elements | 1 |
| - | 2 | - | Credit 2 | Construction Waste Management | 1 to 2 |
| 2 | - | - | Credit 3 | Materials Reuse | 1 to 2 |

Materials and Resources, Continued

| Y | ? | N | | | |
|---|---|---|----------|-----------------------------|--------|
| 2 | - | - | Credit 4 | Recycled Content | 1 to 2 |
| 2 | - | - | Credit 5 | Regional Materials | 1 to 2 |
| - | 1 | - | Credit 6 | Rapidly Renewable Materials | 1 |
| - | 1 | - | Credit 7 | Certified Wood | 1 |

13 2 0 Indoor Environmental Quality Possible Points: 15

| Y | ? | N | | | |
|---|---|---|------------|--|---|
| Y | | | Prereq 1 | Minimum Indoor Air Quality Performance | 0 |
| Y | | | Prereq 2 | Environmental Tobacco Smoke (ETS) Control | 0 |
| 1 | - | - | Credit 1 | Outdoor Air Delivery Monitoring | 1 |
| 1 | - | - | Credit 2 | Increased Ventilation | 1 |
| 1 | - | - | Credit 3.1 | Construction IAQ Management Plan—During Construction | 1 |
| 1 | - | - | Credit 3.2 | Construction IAQ Management Plan—Before Occupancy | 1 |
| 1 | - | - | Credit 4.1 | Low-Emitting Materials—Adhesives and Sealants | 1 |
| 1 | - | - | Credit 4.2 | Low-Emitting Materials—Paints and Coatings | 1 |
| 1 | - | - | Credit 4.3 | Low-Emitting Materials—Flooring Systems | 1 |
| 1 | - | - | Credit 4.4 | Low-Emitting Materials—Composite Wood and Agrifiber Products | 1 |
| 1 | - | - | Credit 5 | Indoor Chemical and Pollutant Source Control | 1 |
| 1 | - | - | Credit 6.1 | Controllability of Systems—Lighting | 1 |
| 1 | - | - | Credit 6.2 | Controllability of Systems—Thermal Comfort | 1 |
| - | 1 | - | Credit 7.1 | Thermal Comfort—Design | 1 |
| 1 | - | - | Credit 7.2 | Thermal Comfort—Verification | 1 |
| 1 | - | - | Credit 8.1 | Daylight and Views—Daylight | 1 |
| - | 1 | - | Credit 8.2 | Daylight and Views—Views | 1 |

1 0 5 Innovation and Design Process Possible Points: 6

| Y | ? | N | | | |
|---|---|---|------------|--------------------------------------|---|
| - | - | 1 | Credit 1.1 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.2 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.3 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.4 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.5 | Innovation in Design: Specific Title | 1 |
| 1 | - | - | Credit 2 | LEED Accredited Professional | 1 |

1 0 0 Regional Priority Credits Possible Points: 4

| Y | ? | N | | | |
|---|---|---|------------|------------------------------------|---|
| 1 | - | - | Credit 1.1 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.2 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.3 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.4 | Regional Priority: Specific Credit | 1 |

53 25 17 Total Possible Points: 110

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110



LEED 2009 for New Construction and Major Renovations

Project Checklist

F.E.Warren Building 222-04

11 3 12 Sustainable Sites Possible Points: 26

| Y | ? | N | | | |
|---|---|---|------------|---|---|
| Y | | | Prereq 1 | Construction Activity Pollution Prevention | |
| 1 | - | - | Credit 1 | Site Selection | 1 |
| - | - | 5 | Credit 2 | Development Density and Community Connectivity | 5 |
| - | - | 1 | Credit 3 | Brownfield Redevelopment | 1 |
| - | - | 6 | Credit 4.1 | Alternative Transportation—Public Transportation Access | 6 |
| 1 | - | - | Credit 4.2 | Alternative Transportation—Bicycle Storage and Changing Rooms | 1 |
| 3 | - | - | Credit 4.3 | Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles | 3 |
| 2 | - | - | Credit 4.4 | Alternative Transportation—Parking Capacity | 2 |
| 1 | - | - | Credit 5.1 | Site Development—Protect or Restore Habitat | 1 |
| 1 | - | - | Credit 5.2 | Site Development—Maximize Open Space | 1 |
| 1 | - | - | Credit 6.1 | Stormwater Design—Quantity Control | 1 |
| - | 1 | - | Credit 6.2 | Stormwater Design—Quality Control | 1 |
| - | 1 | - | Credit 7.1 | Heat Island Effect—Non-roof | 1 |
| - | 1 | - | Credit 7.2 | Heat Island Effect—Roof | 1 |
| 1 | - | - | Credit 8 | Light Pollution Reduction | 1 |

2 6 0 Water Efficiency Possible Points: 10

| Y | ? | N | | | |
|---|---|---|----------|------------------------------------|--------|
| Y | | | Prereq 1 | Water Use Reduction—20% Reduction | |
| - | 4 | - | Credit 1 | Water Efficient Landscaping | 2 to 4 |
| - | 2 | - | Credit 2 | Innovative Wastewater Technologies | 2 |
| 2 | - | - | Credit 3 | Water Use Reduction | 2 to 4 |

16 9 0 Energy and Atmosphere Possible Points: 35

| Y | ? | N | | | |
|----|---|---|----------|--|---------|
| Y | | | Prereq 1 | Fundamental Commissioning of Building Energy Systems | |
| Y | | | Prereq 2 | Minimum Energy Performance | 0 |
| Y | | | Prereq 3 | Fundamental Refrigerant Management | |
| 12 | - | - | Credit 1 | Optimize Energy Performance | 1 to 19 |
| 4 | - | - | Credit 2 | On-Site Renewable Energy | 1 to 7 |
| - | 2 | - | Credit 3 | Enhanced Commissioning | 2 |
| - | 2 | - | Credit 4 | Enhanced Refrigerant Management | 2 |
| - | 3 | - | Credit 5 | Measurement and Verification | 3 |
| - | 2 | - | Credit 6 | Green Power | 2 |

9 5 0 Materials and Resources Possible Points: 14

| Y | ? | N | | | |
|---|---|---|------------|---|--------|
| Y | | | Prereq 1 | Storage and Collection of Recyclables | 0 |
| 3 | - | - | Credit 1.1 | Building Reuse—Maintain Existing Walls, Floors, and Roof | 1 to 3 |
| - | 1 | - | Credit 1.2 | Building Reuse—Maintain 50% of Interior Non-Structural Elements | 1 |
| - | 2 | - | Credit 2 | Construction Waste Management | 1 to 2 |
| 2 | - | - | Credit 3 | Materials Reuse | 1 to 2 |

Materials and Resources, Continued

| Y | ? | N | | | |
|---|---|---|----------|-----------------------------|--------|
| 2 | - | - | Credit 4 | Recycled Content | 1 to 2 |
| 2 | - | - | Credit 5 | Regional Materials | 1 to 2 |
| - | 1 | - | Credit 6 | Rapidly Renewable Materials | 1 |
| - | 1 | - | Credit 7 | Certified Wood | 1 |

13 2 0 Indoor Environmental Quality Possible Points: 15

| Y | ? | N | | | |
|---|---|---|------------|--|---|
| Y | | | Prereq 1 | Minimum Indoor Air Quality Performance | 0 |
| Y | | | Prereq 2 | Environmental Tobacco Smoke (ETS) Control | 0 |
| 1 | - | - | Credit 1 | Outdoor Air Delivery Monitoring | 1 |
| 1 | - | - | Credit 2 | Increased Ventilation | 1 |
| 1 | - | - | Credit 3.1 | Construction IAQ Management Plan—During Construction | 1 |
| 1 | - | - | Credit 3.2 | Construction IAQ Management Plan—Before Occupancy | 1 |
| 1 | - | - | Credit 4.1 | Low-Emitting Materials—Adhesives and Sealants | 1 |
| 1 | - | - | Credit 4.2 | Low-Emitting Materials—Paints and Coatings | 1 |
| 1 | - | - | Credit 4.3 | Low-Emitting Materials—Flooring Systems | 1 |
| 1 | - | - | Credit 4.4 | Low-Emitting Materials—Composite Wood and Agrifiber Products | 1 |
| 1 | - | - | Credit 5 | Indoor Chemical and Pollutant Source Control | 1 |
| 1 | - | - | Credit 6.1 | Controllability of Systems—Lighting | 1 |
| 1 | - | - | Credit 6.2 | Controllability of Systems—Thermal Comfort | 1 |
| - | 1 | - | Credit 7.1 | Thermal Comfort—Design | 1 |
| 1 | - | - | Credit 7.2 | Thermal Comfort—Verification | 1 |
| 1 | - | - | Credit 8.1 | Daylight and Views—Daylight | 1 |
| - | 1 | - | Credit 8.2 | Daylight and Views—Views | 1 |

1 0 5 Innovation and Design Process Possible Points: 6

| Y | ? | N | | | |
|---|---|---|------------|--------------------------------------|---|
| - | - | 1 | Credit 1.1 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.2 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.3 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.4 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.5 | Innovation in Design: Specific Title | 1 |
| 1 | - | - | Credit 2 | LEED Accredited Professional | 1 |

1 0 0 Regional Priority Credits Possible Points: 4

| Y | ? | N | | | |
|---|---|---|------------|------------------------------------|---|
| 1 | - | - | Credit 1.1 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.2 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.3 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.4 | Regional Priority: Specific Credit | 1 |

53 25 17 Total Possible Points: 110

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110

Table III-43 LEED Certification: FEW 323 All Project Alternatives

| Category | 02 | 03 | 04 | Maximum Points |
|-------------------------------|----------------------------------|-------------------------------|--|-----------------------|
| | Demo and New Construction | Modernization with HPS | Modernization with ATFP plus Solar PV | |
| Sustainable Sites | 11 | 11 | 11 | 26 |
| Water Efficiency | 2 | 2 | 2 | 10 |
| Energy and Atmosphere | 21 | 20 | 25 | 35 |
| Materials and Resources | 4 | 9 | 9 | 14 |
| Indoor Environmental Quality | 14 | 13 | 13 | 15 |
| Innovation and Design Process | 1 | 1 | 2 | 6 |
| Regional Priority Credits | 1 | 1 | 1 | 4 |
| Total | 54 | 57 | 63 | 110 |
| Certification Level | Silver | Silver | Gold | NA |

Note: 2009 LEED for New Construction and Major Renovations Project Checklist

Sources: Center for Resource Solutions; Comfort Design; BAE Urban Economics, 2012.



LEED 2009 for New Construction and Major Renovations

Project Checklist

F.E.Warren Building 323-02

11 3 12 Sustainable Sites Possible Points: 26

| Y | ? | N | | | |
|---|---|---|------------|---|---|
| Y | | | Prereq 1 | Construction Activity Pollution Prevention | |
| 1 | - | - | Credit 1 | Site Selection | 1 |
| - | - | 5 | Credit 2 | Development Density and Community Connectivity | 5 |
| - | - | 1 | Credit 3 | Brownfield Redevelopment | 1 |
| - | - | 6 | Credit 4.1 | Alternative Transportation—Public Transportation Access | 6 |
| 1 | - | - | Credit 4.2 | Alternative Transportation—Bicycle Storage and Changing Rooms | 1 |
| 3 | - | - | Credit 4.3 | Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles | 3 |
| 2 | - | - | Credit 4.4 | Alternative Transportation—Parking Capacity | 2 |
| 1 | - | - | Credit 5.1 | Site Development—Protect or Restore Habitat | 1 |
| 1 | - | - | Credit 5.2 | Site Development—Maximize Open Space | 1 |
| 1 | - | - | Credit 6.1 | Stormwater Design—Quantity Control | 1 |
| - | 1 | - | Credit 6.2 | Stormwater Design—Quality Control | 1 |
| - | 1 | - | Credit 7.1 | Heat Island Effect—Non-roof | 1 |
| - | 1 | - | Credit 7.2 | Heat Island Effect—Roof | 1 |
| 1 | - | - | Credit 8 | Light Pollution Reduction | 1 |

2 6 0 Water Efficiency Possible Points: 10

| Y | ? | N | | | |
|---|---|---|----------|------------------------------------|--------|
| | 4 | - | Prereq 1 | Water Use Reduction—20% Reduction | |
| - | 2 | - | Credit 1 | Water Efficient Landscaping | 2 to 4 |
| - | 2 | - | Credit 2 | Innovative Wastewater Technologies | 2 |
| 2 | - | - | Credit 3 | Water Use Reduction | 2 to 4 |

21 6 0 Energy and Atmosphere Possible Points: 35

| Y | ? | N | | | |
|----|---|---|----------|--|---------|
| Y | | | Prereq 1 | Fundamental Commissioning of Building Energy Systems | |
| Y | | | Prereq 2 | Minimum Energy Performance | 0 |
| Y | | | Prereq 3 | Fundamental Refrigerant Management | |
| 14 | - | - | Credit 1 | Optimize Energy Performance | 1 to 19 |
| 4 | - | - | Credit 2 | On-Site Renewable Energy | 1 to 7 |
| - | 2 | - | Credit 3 | Enhanced Commissioning | 2 |
| - | 2 | - | Credit 4 | Enhanced Refrigerant Management | 2 |
| 3 | - | - | Credit 5 | Measurement and Verification | 3 |
| - | 2 | - | Credit 6 | Green Power | 2 |

4 2 12 Materials and Resources Possible Points: 14

| Y | ? | N | | | |
|---|---|---|------------|---|--------|
| | | 3 | Prereq 1 | Storage and Collection of Recyclables | 0 |
| - | - | 3 | Credit 1.1 | Building Reuse—Maintain Existing Walls, Floors, and Roof | 1 to 3 |
| - | - | 3 | Credit 1.2 | Building Reuse—Maintain 50% of Interior Non-Structural Elements | 1 |
| - | - | 3 | Credit 2 | Construction Waste Management | 1 to 2 |
| - | - | 3 | Credit 3 | Materials Reuse | 1 to 2 |

Materials and Resources, Continued

| Y | ? | N | | | |
|---|---|---|----------|-----------------------------|--------|
| 2 | - | - | Credit 4 | Recycled Content | 1 to 2 |
| 2 | - | - | Credit 5 | Regional Materials | 1 to 2 |
| - | 1 | - | Credit 6 | Rapidly Renewable Materials | 1 |
| - | 1 | - | Credit 7 | Certified Wood | 1 |

14 1 0 Indoor Environmental Quality Possible Points: 15

| Y | ? | N | | | |
|---|---|---|------------|--|---|
| Y | | | Prereq 1 | Minimum Indoor Air Quality Performance | 0 |
| Y | | | Prereq 2 | Environmental Tobacco Smoke (ETS) Control | 0 |
| 1 | - | - | Credit 1 | Outdoor Air Delivery Monitoring | 1 |
| 1 | - | - | Credit 2 | Increased Ventilation | 1 |
| 1 | - | - | Credit 3.1 | Construction IAQ Management Plan—During Construction | 1 |
| 1 | - | - | Credit 3.2 | Construction IAQ Management Plan—Before Occupancy | 1 |
| 1 | - | - | Credit 4.1 | Low-Emitting Materials—Adhesives and Sealants | 1 |
| 1 | - | - | Credit 4.2 | Low-Emitting Materials—Paints and Coatings | 1 |
| 1 | - | - | Credit 4.3 | Low-Emitting Materials—Flooring Systems | 1 |
| 1 | - | - | Credit 4.4 | Low-Emitting Materials—Composite Wood and Agrifiber Products | 1 |
| 1 | - | - | Credit 5 | Indoor Chemical and Pollutant Source Control | 1 |
| 1 | - | - | Credit 6.1 | Controllability of Systems—Lighting | 1 |
| 1 | - | - | Credit 6.2 | Controllability of Systems—Thermal Comfort | 1 |
| - | 1 | - | Credit 7.1 | Thermal Comfort—Design | 1 |
| 1 | - | - | Credit 7.2 | Thermal Comfort—Verification | 1 |
| 1 | - | - | Credit 8.1 | Daylight and Views—Daylight | 1 |
| 1 | - | - | Credit 8.2 | Daylight and Views—Views | 1 |

1 0 5 Innovation and Design Process Possible Points: 6

| Y | ? | N | | | |
|---|---|---|------------|--------------------------------------|---|
| - | - | 1 | Credit 1.1 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.2 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.3 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.4 | Innovation in Design: Specific Title | 1 |
| - | - | 1 | Credit 1.5 | Innovation in Design: Specific Title | 1 |
| 1 | - | - | Credit 2 | LEED Accredited Professional | 1 |

1 0 0 Regional Priority Credits Possible Points: 4

| Y | ? | N | | | |
|---|---|---|------------|------------------------------------|---|
| 1 | - | - | Credit 1.1 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.2 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.3 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.4 | Regional Priority: Specific Credit | 1 |

54 18 29 Total Possible Points: 110

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110



LEED 2009 for New Construction and Major Renovations

Project Checklist

F.E.Warren Building 323-03

11 3 12 Sustainable Sites Possible Points: 26

| Y | ? | N | | |
|---|---|---|------------|--|
| Y | | | Prereq 1 | Construction Activity Pollution Prevention |
| 1 | - | - | Credit 1 | Site Selection 1 |
| - | - | 5 | Credit 2 | Development Density and Community Connectivity 5 |
| - | - | 1 | Credit 3 | Brownfield Redevelopment 1 |
| - | - | 6 | Credit 4.1 | Alternative Transportation—Public Transportation Access 6 |
| 1 | - | - | Credit 4.2 | Alternative Transportation—Bicycle Storage and Changing Rooms 1 |
| 3 | - | - | Credit 4.3 | Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicle 3 |
| 2 | - | - | Credit 4.4 | Alternative Transportation—Parking Capacity 2 |
| 1 | - | - | Credit 5.1 | Site Development—Protect or Restore Habitat 1 |
| 1 | - | - | Credit 5.2 | Site Development—Maximize Open Space 1 |
| 1 | - | - | Credit 6.1 | Stormwater Design—Quantity Control 1 |
| - | 1 | - | Credit 6.2 | Stormwater Design—Quality Control 1 |
| - | 1 | - | Credit 7.1 | Heat Island Effect—Non-roof 1 |
| - | 1 | - | Credit 7.2 | Heat Island Effect—Roof 1 |
| 1 | - | - | Credit 8 | Light Pollution Reduction 1 |

2 6 0 Water Efficiency Possible Points: 10

| Y | ? | N | | |
|---|---|---|----------|--------------------------------------|
| Y | | | Prereq 1 | Water Use Reduction—20% Reduction |
| - | 4 | - | Credit 1 | Water Efficient Landscaping 2 to 4 |
| - | 2 | - | Credit 2 | Innovative Wastewater Technologies 2 |
| 2 | - | - | Credit 3 | Water Use Reduction 2 to 4 |

20 9 0 Energy and Atmosphere Possible Points: 35

| Y | ? | N | | |
|----|---|---|----------|--|
| Y | | | Prereq 1 | Fundamental Commissioning of Building Energy Systems |
| Y | | | Prereq 2 | Minimum Energy Performance 0 |
| Y | | | Prereq 3 | Fundamental Refrigerant Management |
| 16 | - | - | Credit 1 | Optimize Energy Performance 1 to 19 |
| 4 | - | - | Credit 2 | On-Site Renewable Energy 1 to 7 |
| - | 2 | - | Credit 3 | Enhanced Commissioning 2 |
| - | 2 | - | Credit 4 | Enhanced Refrigerant Management 2 |
| - | 3 | - | Credit 5 | Measurement and Verification 3 |
| - | 2 | - | Credit 6 | Green Power 2 |

9 5 0 Materials and Resources Possible Points: 14

| Y | ? | N | | |
|---|---|---|------------|---|
| Y | | | Prereq 1 | Storage and Collection of Recyclables 0 |
| 3 | - | - | Credit 1.1 | Building Reuse—Maintain Existing Walls, Floors, and Roof 1 to 3 |
| - | 1 | - | Credit 1.2 | Building Reuse—Maintain 50% of Interior Non-Structural Elements 1 |
| - | 2 | - | Credit 2 | Construction Waste Management 1 to 2 |
| 2 | - | - | Credit 3 | Materials Reuse 1 to 2 |

Materials and Resources, Continued

| Y | ? | N | | |
|---|---|---|----------|-------------------------------|
| 2 | - | - | Credit 4 | Recycled Content 1 to 2 |
| 2 | - | - | Credit 5 | Regional Materials 1 to 2 |
| - | 1 | - | Credit 6 | Rapidly Renewable Materials 1 |
| - | 1 | - | Credit 7 | Certified Wood 1 |

13 2 0 Indoor Environmental Quality Possible Points: 15

| Y | ? | N | | |
|---|---|---|------------|--|
| Y | | | Prereq 1 | Minimum Indoor Air Quality Performance 0 |
| Y | | | Prereq 2 | Environmental Tobacco Smoke (ETS) Control 0 |
| 1 | - | - | Credit 1 | Outdoor Air Delivery Monitoring 1 |
| 1 | - | - | Credit 2 | Increased Ventilation 1 |
| 1 | - | - | Credit 3.1 | Construction IAQ Management Plan—During Construction 1 |
| 1 | - | - | Credit 3.2 | Construction IAQ Management Plan—Before Occupancy 1 |
| 1 | - | - | Credit 4.1 | Low-Emitting Materials—Adhesives and Sealants 1 |
| 1 | - | - | Credit 4.2 | Low-Emitting Materials—Paints and Coatings 1 |
| 1 | - | - | Credit 4.3 | Low-Emitting Materials—Flooring Systems 1 |
| 1 | - | - | Credit 4.4 | Low-Emitting Materials—Composite Wood and Agrifiber Products 1 |
| 1 | - | - | Credit 5 | Indoor Chemical and Pollutant Source Control 1 |
| 1 | - | - | Credit 6.1 | Controllability of Systems—Lighting 1 |
| 1 | - | - | Credit 6.2 | Controllability of Systems—Thermal Comfort 1 |
| - | 1 | - | Credit 7.1 | Thermal Comfort—Design 1 |
| 1 | - | - | Credit 7.2 | Thermal Comfort—Verification 1 |
| 1 | - | - | Credit 8.1 | Daylight and Views—Daylight 1 |
| - | 1 | - | Credit 8.2 | Daylight and Views—Views 1 |

1 0 5 Innovation and Design Process Possible Points: 6

| Y | ? | N | | |
|---|---|---|------------|--|
| - | - | 1 | Credit 1.1 | Innovation in Design: Specific Title 1 |
| - | - | 1 | Credit 1.2 | Innovation in Design: Specific Title 1 |
| - | - | 1 | Credit 1.3 | Innovation in Design: Specific Title 1 |
| - | - | 1 | Credit 1.4 | Innovation in Design: Specific Title 1 |
| - | - | 1 | Credit 1.5 | Innovation in Design: Specific Title 1 |
| 1 | - | - | Credit 2 | LEED Accredited Professional 1 |

1 0 0 Regional Priority Credits Possible Points: 4

| Y | ? | N | | |
|---|---|---|------------|--------------------------------------|
| 1 | - | - | Credit 1.1 | Regional Priority: Specific Credit 1 |
| - | - | - | Credit 1.2 | Regional Priority: Specific Credit 1 |
| - | - | - | Credit 1.3 | Regional Priority: Specific Credit 1 |
| - | - | - | Credit 1.4 | Regional Priority: Specific Credit 1 |

57 25 17 Total Possible Points: 110

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110



LEED 2009 for New Construction and Major Renovations

Project Checklist

F.E.Warren Building 323-04

11 3 12 Sustainable Sites Possible Points: 26

| Y | ? | N | | | |
|---|---|---|------------|---|---|
| Y | | | Prereq 1 | Construction Activity Pollution Prevention | |
| 1 | - | - | Credit 1 | Site Selection | 1 |
| - | - | 5 | Credit 2 | Development Density and Community Connectivity | 5 |
| - | - | 1 | Credit 3 | Brownfield Redevelopment | 1 |
| - | - | 6 | Credit 4.1 | Alternative Transportation—Public Transportation Access | 6 |
| 1 | - | - | Credit 4.2 | Alternative Transportation—Bicycle Storage and Changing Rooms | 1 |
| 3 | - | - | Credit 4.3 | Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles | 3 |
| 2 | - | - | Credit 4.4 | Alternative Transportation—Parking Capacity | 2 |
| 1 | - | - | Credit 5.1 | Site Development—Protect or Restore Habitat | 1 |
| 1 | - | - | Credit 5.2 | Site Development—Maximize Open Space | 1 |
| 1 | - | - | Credit 6.1 | Stormwater Design—Quantity Control | 1 |
| - | 1 | - | Credit 6.2 | Stormwater Design—Quality Control | 1 |
| - | 1 | - | Credit 7.1 | Heat Island Effect—Non-roof | 1 |
| - | 1 | - | Credit 7.2 | Heat Island Effect—Roof | 1 |
| 1 | - | - | Credit 8 | Light Pollution Reduction | 1 |

2 6 0 Water Efficiency Possible Points: 10

| Y | ? | N | | | |
|---|---|---|----------|------------------------------------|--------|
| Y | | | Prereq 1 | Water Use Reduction—20% Reduction | |
| - | 4 | - | Credit 1 | Water Efficient Landscaping | 2 to 4 |
| - | 2 | - | Credit 2 | Innovative Wastewater Technologies | 2 |
| 2 | - | - | Credit 3 | Water Use Reduction | 2 to 4 |

25 7 0 Energy and Atmosphere Possible Points: 35

| Y | ? | N | | | |
|----|---|---|----------|--|---------|
| Y | | | Prereq 1 | Fundamental Commissioning of Building Energy Systems | |
| Y | | | Prereq 2 | Minimum Energy Performance | 0 |
| Y | | | Prereq 3 | Fundamental Refrigerant Management | |
| 16 | - | - | Credit 1 | Optimize Energy Performance | 1 to 19 |
| 7 | - | - | Credit 2 | On-Site Renewable Energy | 1 to 7 |
| - | 2 | - | Credit 3 | Enhanced Commissioning | 2 |
| - | 2 | - | Credit 4 | Enhanced Refrigerant Management | 2 |
| - | 3 | - | Credit 5 | Measurement and Verification | 3 |
| 2 | - | - | Credit 6 | Green Power | 2 |

9 5 0 Materials and Resources Possible Points: 14

| Y | ? | N | | | |
|---|---|---|------------|---|--------|
| Y | | | Prereq 1 | Storage and Collection of Recyclables | 0 |
| 3 | - | - | Credit 1.1 | Building Reuse—Maintain Existing Walls, Floors, and Roof | 1 to 3 |
| - | 1 | - | Credit 1.2 | Building Reuse—Maintain 50% of Interior Non-Structural Elements | 1 |
| - | 2 | - | Credit 2 | Construction Waste Management | 1 to 2 |
| 2 | - | - | Credit 3 | Materials Reuse | 1 to 2 |

Materials and Resources, Continued

| Y | ? | N | | | |
|---|---|---|----------|-----------------------------|--------|
| 2 | - | - | Credit 4 | Recycled Content | 1 to 2 |
| 2 | - | - | Credit 5 | Regional Materials | 1 to 2 |
| - | 1 | - | Credit 6 | Rapidly Renewable Materials | 1 |
| - | 1 | - | Credit 7 | Certified Wood | 1 |

13 2 0 Indoor Environmental Quality Possible Points: 15

| Y | ? | N | | | |
|---|---|---|------------|--|---|
| Y | | | Prereq 1 | Minimum Indoor Air Quality Performance | 0 |
| Y | | | Prereq 2 | Environmental Tobacco Smoke (ETS) Control | 0 |
| 1 | - | - | Credit 1 | Outdoor Air Delivery Monitoring | 1 |
| 1 | - | - | Credit 2 | Increased Ventilation | 1 |
| 1 | - | - | Credit 3.1 | Construction IAQ Management Plan—During Construction | 1 |
| 1 | - | - | Credit 3.2 | Construction IAQ Management Plan—Before Occupancy | 1 |
| 1 | - | - | Credit 4.1 | Low-Emitting Materials—Adhesives and Sealants | 1 |
| 1 | - | - | Credit 4.2 | Low-Emitting Materials—Paints and Coatings | 1 |
| 1 | - | - | Credit 4.3 | Low-Emitting Materials—Flooring Systems | 1 |
| 1 | - | - | Credit 4.4 | Low-Emitting Materials—Composite Wood and Agrifiber Products | 1 |
| 1 | - | - | Credit 5 | Indoor Chemical and Pollutant Source Control | 1 |
| 1 | - | - | Credit 6.1 | Controllability of Systems—Lighting | 1 |
| 1 | - | - | Credit 6.2 | Controllability of Systems—Thermal Comfort | 1 |
| - | 1 | - | Credit 7.1 | Thermal Comfort—Design | 1 |
| 1 | - | - | Credit 7.2 | Thermal Comfort—Verification | 1 |
| 1 | - | - | Credit 8.1 | Daylight and Views—Daylight | 1 |
| - | 1 | - | Credit 8.2 | Daylight and Views—Views | 1 |

2 4 0 Innovation and Design Process Possible Points: 6

| Y | ? | N | | | |
|---|---|---|------------|--------------------------------------|---|
| - | 1 | - | Credit 1.1 | Innovation in Design: Specific Title | 1 |
| - | 1 | - | Credit 1.2 | Innovation in Design: Specific Title | 1 |
| - | 1 | - | Credit 1.3 | Innovation in Design: Specific Title | 1 |
| 1 | - | - | Credit 1.4 | Innovation in Design: Specific Title | 1 |
| - | 1 | - | Credit 1.5 | Innovation in Design: Specific Title | 1 |
| 1 | - | - | Credit 2 | LEED Accredited Professional | 1 |

1 0 0 Regional Priority Credits Possible Points: 4

| Y | ? | N | | | |
|---|---|---|------------|------------------------------------|---|
| 1 | - | - | Credit 1.1 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.2 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.3 | Regional Priority: Specific Credit | 1 |
| - | - | - | Credit 1.4 | Regional Priority: Specific Credit | 1 |

63 27 12 Total Possible Points: 110

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110

Table III-43 LEED Certification: FEW 323 All Project Alternatives

| Category | 02 | 03 | 04 | Maximum Points |
|-------------------------------|----------------------------------|-------------------------------|--|-----------------------|
| | Demo and New Construction | Modernization with HPS | Modernization with ATRP plus Solar PV | |
| Sustainable Sites | 11 | 11 | 11 | 26 |
| Water Efficiency | 2 | 2 | 2 | 10 |
| Energy and Atmosphere | 21 | 20 | 25 | 35 |
| Materials and Resources | 4 | 9 | 9 | 14 |
| Indoor Environmental Quality | 14 | 13 | 13 | 15 |
| Innovation and Design Process | 1 | 1 | 2 | 6 |
| Regional Priority Credits | 1 | 1 | 1 | 4 |
| Total | 54 | 57 | 63 | 110 |
| Certification Level | Silver | Silver | Gold | NA |

Note: 2009 LEED for New Construction and Major Renovations Project Checklist

Sources: Center for Resource Solutions; Comfort Design; BAE Urban Economics, 2012.

Appendix F: Life-Cycle Cost Analysis Detail

Attached, are print-outs for each of the 24 LCCA calculations made for this Study.

Life Cycle Cost Analysis (LCCA) Spreadsheet

Fort Bliss, El Paso TX

**ESTCP SI 0931
LCCA Demonstration**

Historic Building 1

Mission: General Administrative Office

Prepared by:
BAE Urban Economics, Inc.

December 2012

Table III-7: Life Cycle Cost Analysis Summary: FTBL 001

| Project Alternative | Non Discounted Costs by Component | | | Total Costs | | |
|--|-----------------------------------|--------------|----------------|----------------|---------------|--------------|
| | Initial | Recurring | Residual Value | Non Discounted | Discounted - | Discounted - |
| | Investment | | | | No GHG Factor | w/GHG Factor |
| FTBL 001-01: Sustainment-Status Quo | \$ 1,413,053 | \$ 4,412,233 | \$ - | \$ 5,825,286 | \$ 4,633,189 | \$ 4,957,645 |
| FTBL 001-02: Demolition and New Construction | \$ 8,707,799 | \$ 3,934,495 | \$ (3,769,689) | \$ 8,872,605 | \$ 9,314,907 | \$ 9,592,548 |
| FTBL 001-03: Modernization with HPS | \$ 7,030,562 | \$ 3,923,858 | \$ (3,102,498) | \$ 7,851,923 | \$ 8,038,442 | \$ 8,282,166 |
| FTBL 001-04: Modernization with AT/FP | \$ 7,639,083 | \$ 3,934,102 | \$ (3,316,482) | \$ 8,256,703 | \$ 8,522,780 | \$ 8,777,667 |

Notes:

| | |
|--|----------|
| Study Period (years): | 30 |
| Real Discount Rate: | 2.00% |
| Average CO _{2e} Value/MT (undiscounted) | \$ 37.36 |
| Base Date: | 10/01/12 |

Sources: Preservation Associates; BAE Urban Economics, 2012.

Table III-8: Greenhouse Gas Valuation Summary: FTBL 001

| Project Alternative | GHG Emissions by Scope (MT CO _{2e}) | | | | GHG Value | |
|--|---|----------|-----------|----------|----------------|------------|
| | Scope 1 | Scope 2 | Scope 3 | Total | Non Discounted | Discounted |
| | FTBL 001-01: Sustainment-Status Quo | - | 12,301.18 | 202.16 | 12,503.34 | \$ 467,078 |
| FTBL 001-02: Demolition and New Construction | - | 8,364.93 | 1,584.75 | 9,949.68 | \$ 371,050 | \$ 277,641 |
| FTBL 001-03: Modernization with HPS | - | 8,277.29 | 830.94 | 9,108.23 | \$ 339,946 | \$ 243,725 |
| FTBL 001-04: Modernization with AT/FP | - | 8,361.69 | 958.85 | 9,320.55 | \$ 347,822 | \$ 254,887 |

Notes:

| | |
|--|----------|
| Study Period (years): | 30 |
| Real Discount Rate: | 2.00% |
| Average CO _{2e} Value/MT (undiscounted) | \$ 37.36 |
| Base Date: | 10/01/12 |

Sources: Center for Resource Solutions; BAE Urban Economics, 2012.

Table 3: Alternatives Summary: FTBL 001

| Project Alternative | Building GSF | | Building Features | | Construction Cost | |
|--|--------------|-----------|-------------------|-------|-------------------|--------|
| | Total | Footprint | LEED | AT/FP | Total | Per SF |
| FTBL 001-01: Sustainment-Status Quo | 22,842 | 15,256 | n/a | No | \$ 1,413,053 | \$ 62 |
| FTBL 001-02: Demolition and New Construction | 22,842 | 15,256 | 52 | Yes | \$ 8,707,799 | \$ 381 |
| FTBL 001-03: Modernization with HPS | 22,842 | 15,256 | 58 | Yes | \$ 7,030,562 | \$ 308 |
| FTBL 001-04: Modernization with AT/FP | 22,842 | 15,256 | 58 | Yes+ | \$ 7,639,083 | \$ 334 |

Note:

+ Current prescriptive practices and treatments.

Sources: Preservation Associates; Center for Resource Solutions; BAE Urban Economics, 2012.

Table 4: Construction Cost Summary: FTBL 001

| Category | Cost Estimate | | | |
|----------------------------------|-----------------------------------|---|----------------------------------|------------------------------------|
| | 01. Sustainment- Status Quo | 02. Demolition and New Construction | 03. Modernization with HPS | 04. Modernization with AT/FP |
| Demolition | \$ - | \$ 733,457 | \$ 467,586 | \$ 623,448 |
| Substructure | \$ 25,200 | \$ 611,156 | \$ 96,075 | \$ 96,075 |
| Shell | \$ 468,688 | \$ 1,970,836 | \$ 1,198,916 | \$ 1,434,634 |
| Interiors | \$ 289,724 | \$ 555,379 | \$ 558,420 | \$ 592,859 |
| Services | \$ 219,443 | \$ 2,109,824 | \$ 2,241,489 | \$ 2,238,235 |
| Sitework | \$ - | \$ 643,075 | \$ 328,375 | \$ 320,428 |
| Special Construction | \$ - | \$ 18,666 | \$ 18,666 | \$ 29,391 |
| Hard Cost Subtotal | \$ 1,003,055 | \$ 6,087,014 | \$ 4,909,527 | \$ 5,335,070 |
| General conditions (25%) | \$ 250,764 | \$ 1,545,306 | \$ 1,246,996 | \$ 1,355,570 |
| Security escalation (2%) | \$ - | \$ 94,210 | \$ 82,197 | \$ 87,656 |
| USACE design (7%) | \$ 87,767 | \$ 540,857 | \$ 436,449 | \$ 474,450 |
| USACE SOIH (5.7%) | \$ 71,468 | \$ 440,412 | \$ 355,394 | \$ 386,337 |
| Soft Cost Subtotal | \$ 409,999 | \$ 2,620,785 | \$ 2,121,035 | \$ 2,304,013 |
| Construction Cost Total | \$ 1,413,053 | \$ 8,707,799 | \$ 7,030,562 | \$ 7,639,083 |
| Construction Cost PSF | \$62 | \$ 381 | \$ 308 | \$ 334 |
| % Difference from FTBL 02 | -84% | N/A | -19% | -12% |

Sources: Preservation Associates; BAE Urban Economics Inc. 2012.

Table 5: NPV Calculation 001-01: Sustainment-Status Quo

| Mid Year | One Time | | | | | | Recurring | | | Residual Value | | Net Present Value | | | | |
|---------------|------------------|--------------|----------------------|------------|------|------------------|---------------------------|--------------|---------------------|------------------|----------|-------------------|------------------|------------|--------------|--------------|
| | New Construction | Sustainment | Temporary Facilities | Relocation | Demo | Site Preparation | Environmental Remediation | Utilities | Repairs Maintenance | Other Operations | Building | Land | Undiscounted Sum | NPV Factor | Mid-Year | Cum NPV |
| 2012 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | 0.99 | \$ - | \$ - |
| 2013 | \$ - | \$ 1,413,053 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 54,200 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 1,560,127 | 0.97 | \$ 1,514,467 | \$ 1,514,467 |
| 2014 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 54,200 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 147,074 | 0.95 | \$ 139,971 | \$ 1,654,438 |
| 2015 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 54,200 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 147,074 | 0.93 | \$ 137,226 | \$ 1,791,664 |
| 2016 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 54,200 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 147,074 | 0.91 | \$ 134,535 | \$ 1,926,199 |
| 2017 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 54,200 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 147,074 | 0.90 | \$ 131,897 | \$ 2,058,096 |
| 2018 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 54,200 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 147,074 | 0.88 | \$ 129,311 | \$ 2,187,408 |
| 2019 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 54,200 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 147,074 | 0.86 | \$ 126,776 | \$ 2,314,183 |
| 2020 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 54,200 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 147,074 | 0.85 | \$ 124,290 | \$ 2,438,473 |
| 2021 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 54,200 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 147,074 | 0.83 | \$ 121,853 | \$ 2,560,326 |
| 2022 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 54,200 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 147,074 | 0.81 | \$ 119,464 | \$ 2,679,789 |
| 2023 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 54,200 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 147,074 | 0.80 | \$ 117,121 | \$ 2,796,911 |
| 2024 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 54,200 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 147,074 | 0.78 | \$ 114,825 | \$ 2,911,735 |
| 2025 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 54,200 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 147,074 | 0.77 | \$ 112,573 | \$ 3,024,308 |
| 2026 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 54,200 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 147,074 | 0.75 | \$ 110,366 | \$ 3,134,674 |
| 2027 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 54,200 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 147,074 | 0.74 | \$ 108,202 | \$ 3,242,876 |
| 2028 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 54,200 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 147,074 | 0.72 | \$ 106,080 | \$ 3,348,956 |
| 2029 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 54,200 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 147,074 | 0.71 | \$ 104,000 | \$ 3,452,956 |
| 2030 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 54,200 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 147,074 | 0.69 | \$ 101,961 | \$ 3,554,917 |
| 2031 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 54,200 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 147,074 | 0.68 | \$ 99,962 | \$ 3,654,879 |
| 2032 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 54,200 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 147,074 | 0.67 | \$ 98,002 | \$ 3,752,881 |
| 2033 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 54,200 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 147,074 | 0.65 | \$ 96,080 | \$ 3,848,961 |
| 2034 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 54,200 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 147,074 | 0.64 | \$ 94,196 | \$ 3,943,157 |
| 2035 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 54,200 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 147,074 | 0.63 | \$ 92,349 | \$ 4,035,506 |
| 2036 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 54,200 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 147,074 | 0.62 | \$ 90,538 | \$ 4,126,045 |
| 2037 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 54,200 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 147,074 | 0.60 | \$ 88,763 | \$ 4,214,808 |
| 2038 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 54,200 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 147,074 | 0.59 | \$ 87,023 | \$ 4,301,830 |
| 2039 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 54,200 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 147,074 | 0.58 | \$ 85,316 | \$ 4,387,147 |
| 2040 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 54,200 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 147,074 | 0.57 | \$ 83,644 | \$ 4,470,790 |
| 2041 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 54,200 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 147,074 | 0.56 | \$ 82,003 | \$ 4,552,794 |
| 2042 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 54,200 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 147,074 | 0.55 | \$ 80,396 | \$ 4,633,189 |
| TOTALS | \$ - | \$ 1,413,053 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 1,625,989 | \$ 882,077 | \$ 1,904,166 | \$ - | \$ - | \$ 5,825,286 | | \$ 4,633,189 | \$ 4,633,189 |

Notes:

Project Alternative Summary

| | |
|--------------------|--------------|
| Capital Costs | \$ 1,413,053 |
| Recurring Costs | \$ 4,412,233 |
| Residual Value | \$ - |
| Non Discounted Sum | \$ 5,825,286 |
| Cum NPV | \$ 4,633,189 |

Key Assumptions:

| | | | |
|-----------------------------|------------------|---------------------------------|--|
| Discount Rate | 2.00% | Repairs and Maintenance | \$ 1.29 |
| Study Period | 30 years | Other Operations | \$ 2.78 |
| BaseYear | 2012 | Cleaning per sq. ft. | \$ 1.12 |
| Report Output | Constant Dollars | Roads and Grounds | \$ 0.27 |
| Cost per sq. ft. | \$62 | Administrative | \$ 1.39 |
| Construction Period (years) | 1 | BOMA Expense CPI Adjustment | 2.16% |
| Building Size (sq. ft.) | 22,842 | Effective utilities per sq. ft. | \$ 2.37 Not from BOMA; calculated based on option-specific energy usage. |

Source: BAE Urban Economics, 2012.

Table 6: Schedule of Recurring Expenditures: FTBL 001-01 Sustainment-Status Quo

| Year | Total Annual Expenditures | Electrical | | | Natural Gas | | | Water/Sewer (a) | | | | | |
|------|---------------------------|------------|---------|----------|-------------|-------|----------|-----------------|-------|---------|-------|---------|-------|
| | | Total Cost | kWh | \$/kWh | Total Cost | MMBtu | \$/MMBtu | Total Cost | Water | \$/Kgal | Waste | \$/Kgal | Other |
| 2012 | \$ 54,200 | \$ 49,766 | 829,432 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2013 | \$ 54,200 | \$ 49,766 | 829,432 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2014 | \$ 54,200 | \$ 49,766 | 829,432 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2015 | \$ 54,200 | \$ 49,766 | 829,432 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2016 | \$ 54,200 | \$ 49,766 | 829,432 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2017 | \$ 54,200 | \$ 49,766 | 829,432 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2018 | \$ 54,200 | \$ 49,766 | 829,432 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2019 | \$ 54,200 | \$ 49,766 | 829,432 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2020 | \$ 54,200 | \$ 49,766 | 829,432 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2021 | \$ 54,200 | \$ 49,766 | 829,432 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2022 | \$ 54,200 | \$ 49,766 | 829,432 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2023 | \$ 54,200 | \$ 49,766 | 829,432 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2024 | \$ 54,200 | \$ 49,766 | 829,432 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2025 | \$ 54,200 | \$ 49,766 | 829,432 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2026 | \$ 54,200 | \$ 49,766 | 829,432 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2027 | \$ 54,200 | \$ 49,766 | 829,432 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2028 | \$ 54,200 | \$ 49,766 | 829,432 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2029 | \$ 54,200 | \$ 49,766 | 829,432 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2030 | \$ 54,200 | \$ 49,766 | 829,432 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2031 | \$ 54,200 | \$ 49,766 | 829,432 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2032 | \$ 54,200 | \$ 49,766 | 829,432 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2033 | \$ 54,200 | \$ 49,766 | 829,432 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2034 | \$ 54,200 | \$ 49,766 | 829,432 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2035 | \$ 54,200 | \$ 49,766 | 829,432 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2036 | \$ 54,200 | \$ 49,766 | 829,432 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2037 | \$ 54,200 | \$ 49,766 | 829,432 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2038 | \$ 54,200 | \$ 49,766 | 829,432 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2039 | \$ 54,200 | \$ 49,766 | 829,432 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2040 | \$ 54,200 | \$ 49,766 | 829,432 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2041 | \$ 54,200 | \$ 49,766 | 829,432 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2042 | \$ 54,200 | \$ 49,766 | 829,432 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |

Notes:

(a) Water and sewer combined and calculated on square foot basis based upon BOMA ERR data.

CPI adjustment factor: 2.16% bring 2011 BOMA ERR data to 2012 dollars.
 Water/sewer utility expense \$0.19 per sq. ft.
 Building total sq. ft. 22,842

Source: BAE Urban Economics, 2012.

Table 7: Depreciation Schedule & Residual Value FTBL 001-01 Sustainment-Status Quo

| Period | Depreciation Schedule | Residual Value |
|---------------|----------------------------------|---------------------------|
| 2012 | \$ - | \$ - |
| 2013 | \$ 1,413,053 | \$ - |
| 2014 | \$ 1,342,400 | \$ - |
| 2015 | \$ 1,271,748 | \$ - |
| 2016 | \$ 1,201,095 | \$ - |
| 2017 | \$ 1,130,442 | \$ - |
| 2018 | \$ 1,059,790 | \$ - |
| 2019 | \$ 989,137 | \$ - |
| 2020 | \$ 918,485 | \$ - |
| 2021 | \$ 847,832 | \$ - |
| 2022 | \$ 777,179 | \$ - |
| 2023 | \$ 706,527 | \$ - |
| 2024 | \$ 635,874 | \$ - |
| 2025 | \$ 565,221 | \$ - |
| 2026 | \$ 494,569 | \$ - |
| 2027 | \$ 423,916 | \$ - |
| 2028 | \$ 353,263 | \$ - |
| 2029 | \$ 282,611 | \$ - |
| 2030 | \$ 211,958 | \$ - |
| 2031 | \$ 141,305 | \$ - |
| 2032 | \$ 70,653 | \$ - |
| 2033 | \$ - | \$ - |
| 2034 | \$ - | \$ - |
| 2035 | \$ - | \$ - |
| 2036 | \$ - | \$ - |
| 2037 | \$ - | \$ - |
| 2038 | \$ - | \$ - |
| 2039 | \$ - | \$ - |
| 2040 | \$ - | \$ - |
| 2041 | \$ - | \$ - |
| 2042 | \$ - | \$ - |

Note:

Useful life of asset: 20.0 years

Source: BAE Urban Economics, Inc. 2012.

Table 8: NPV Calculation FTBL 001-02: Demolition and New Construction

| Mid Year | One Time | | | | | | | Recurring | | | Residual Value | | Net Present Value | | | |
|----------|------------------|--------------|----------------------|------------|------------|------------------|---------------------------|--------------|---------------------|------------------|----------------|------|-------------------|------------|----------------|---------------|
| | New Construction | Major Repair | Temporary Facilities | Relocation | Demo | Site Preparation | Environmental Remediation | Utilities | Repairs Maintenance | Other Operations | Building | Land | Undiscounted Sum | NPV Factor | Mid-Year | Cum NPV |
| 2012 | \$ - | \$ - | \$ - | \$ - | \$ 733,457 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 733,457 | 0.99 | \$ 726,230 | \$ 726,230 |
| 2013 | \$ 7,974,342 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,275 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 8,105,492 | 0.97 | \$ 7,868,268 | \$ 8,594,498 |
| 2014 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,275 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,150 | 0.95 | \$ 124,815 | \$ 8,719,313 |
| 2015 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,275 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,150 | 0.93 | \$ 122,368 | \$ 8,841,681 |
| 2016 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,275 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,150 | 0.91 | \$ 119,968 | \$ 8,961,650 |
| 2017 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,275 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,150 | 0.90 | \$ 117,616 | \$ 9,079,266 |
| 2018 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,275 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,150 | 0.88 | \$ 115,310 | \$ 9,194,575 |
| 2019 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,275 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,150 | 0.86 | \$ 113,049 | \$ 9,307,624 |
| 2020 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,275 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,150 | 0.85 | \$ 110,832 | \$ 9,418,457 |
| 2021 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,275 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,150 | 0.83 | \$ 108,659 | \$ 9,527,116 |
| 2022 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,275 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,150 | 0.81 | \$ 106,529 | \$ 9,633,644 |
| 2023 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,275 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,150 | 0.80 | \$ 104,440 | \$ 9,738,084 |
| 2024 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,275 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,150 | 0.78 | \$ 102,392 | \$ 9,840,476 |
| 2025 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,275 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,150 | 0.77 | \$ 100,384 | \$ 9,940,860 |
| 2026 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,275 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,150 | 0.75 | \$ 98,416 | \$ 10,039,276 |
| 2027 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,275 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,150 | 0.74 | \$ 96,486 | \$ 10,135,762 |
| 2028 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,275 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,150 | 0.72 | \$ 94,594 | \$ 10,230,356 |
| 2029 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,275 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,150 | 0.71 | \$ 92,739 | \$ 10,323,096 |
| 2030 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,275 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,150 | 0.69 | \$ 90,921 | \$ 10,414,017 |
| 2031 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,275 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,150 | 0.68 | \$ 89,138 | \$ 10,503,155 |
| 2032 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,275 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,150 | 0.67 | \$ 87,390 | \$ 10,590,546 |
| 2033 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,275 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,150 | 0.65 | \$ 85,677 | \$ 10,676,223 |
| 2034 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,275 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,150 | 0.64 | \$ 83,997 | \$ 10,760,220 |
| 2035 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,275 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,150 | 0.63 | \$ 82,350 | \$ 10,842,570 |
| 2036 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,275 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,150 | 0.62 | \$ 80,735 | \$ 10,923,305 |
| 2037 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,275 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,150 | 0.60 | \$ 79,152 | \$ 11,002,457 |
| 2038 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,275 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,150 | 0.59 | \$ 77,600 | \$ 11,080,058 |
| 2039 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,275 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,150 | 0.58 | \$ 76,079 | \$ 11,156,136 |
| 2040 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,275 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,150 | 0.57 | \$ 74,587 | \$ 11,230,723 |
| 2041 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,275 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,150 | 0.56 | \$ 73,124 | \$ 11,303,848 |
| 2042 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,275 | \$ 29,403 | \$ 63,472 | \$ (3,769,689) | \$ - | \$ (3,638,539) | 0.55 | \$ (1,988,941) | \$ 9,314,907 |
| TOTALS | \$ 7,974,342 | \$ - | \$ - | \$ - | \$ 733,457 | \$ - | \$ - | \$ 1,148,251 | \$ 882,077 | \$ 1,904,166 | \$ (3,769,689) | \$ - | \$ 8,872,605 | | \$ 9,314,907 | \$ 9,314,907 |

NOTES:

Project Alternative Summary

| | |
|--------------------|----------------|
| Capital Costs | \$ 8,707,799 |
| Recurring Costs | \$ 3,934,495 |
| Residual Value | \$ (3,769,689) |
| Non Discounted Sum | \$ 8,872,605 |
| Cum NPV | \$ 9,314,907 |

Key Assumptions:

| | | | |
|-----------------------------|------------------|---------------------------------|---------|
| Discount Rate | 2.00% | Repairs and Maintenance | \$ 1.29 |
| Study Period | 30 years | Other Operations | \$ 2.78 |
| BaseYear | 2012 | Cleaning per sq. ft. | \$ 1.12 |
| Report Output | Constant Dollars | Roads and Grounds | \$ 0.27 |
| Cost per sq. ft. | \$381 | Administrative | \$ 1.39 |
| Construction Period (years) | 1 | BOMA Expense CPI Adjustment | 2.16% |
| Building Size (sq. ft.) | 22,842 | Effective utilities per sq. ft. | \$ 1.68 |

Not from BOMA; calculated based on option-specific energy usage.

Source: BAE Urban Economics, 2012.

Table 9: Schedule of Recurring Expenditures: FTBL 001-02 Demolition and New Construction

| Year | Total Annual Expenditures | Electrical | | | Natural Gas | | | Water/Sewer (a) | | | | Other | |
|------|---------------------------|------------|---------|----------|-------------|-------|----------|-----------------|--------|---------|--------|-------|---------|
| | | Total Cost | kWh | \$/kWh | Total Cost | MMBtu | \$/MMBtu | Total Cost | (Kgal) | \$/Kgal | (Kgal) | | \$/Kgal |
| 2012 | \$ 38,275 | \$ 33,841 | 564,022 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2013 | \$ 38,275 | \$ 33,841 | 564,022 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2014 | \$ 38,275 | \$ 33,841 | 564,022 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2015 | \$ 38,275 | \$ 33,841 | 564,022 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2016 | \$ 38,275 | \$ 33,841 | 564,022 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2017 | \$ 38,275 | \$ 33,841 | 564,022 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2018 | \$ 38,275 | \$ 33,841 | 564,022 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2019 | \$ 38,275 | \$ 33,841 | 564,022 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2020 | \$ 38,275 | \$ 33,841 | 564,022 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2021 | \$ 38,275 | \$ 33,841 | 564,022 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2022 | \$ 38,275 | \$ 33,841 | 564,022 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2023 | \$ 38,275 | \$ 33,841 | 564,022 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2024 | \$ 38,275 | \$ 33,841 | 564,022 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2025 | \$ 38,275 | \$ 33,841 | 564,022 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2026 | \$ 38,275 | \$ 33,841 | 564,022 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2027 | \$ 38,275 | \$ 33,841 | 564,022 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2028 | \$ 38,275 | \$ 33,841 | 564,022 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2029 | \$ 38,275 | \$ 33,841 | 564,022 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2030 | \$ 38,275 | \$ 33,841 | 564,022 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2031 | \$ 38,275 | \$ 33,841 | 564,022 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2032 | \$ 38,275 | \$ 33,841 | 564,022 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2033 | \$ 38,275 | \$ 33,841 | 564,022 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2034 | \$ 38,275 | \$ 33,841 | 564,022 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2035 | \$ 38,275 | \$ 33,841 | 564,022 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2036 | \$ 38,275 | \$ 33,841 | 564,022 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2037 | \$ 38,275 | \$ 33,841 | 564,022 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2038 | \$ 38,275 | \$ 33,841 | 564,022 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2039 | \$ 38,275 | \$ 33,841 | 564,022 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2040 | \$ 38,275 | \$ 33,841 | 564,022 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2041 | \$ 38,275 | \$ 33,841 | 564,022 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2042 | \$ 38,275 | \$ 33,841 | 564,022 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |

Notes:

- (a) Water and sewer combined and calculated on square foot basis based upon BOMA ERR data.
 - CPI adjustment factor: 2.16% bring 2011 BOMA ERR data to 2012 dollars.
 - Water/sewer utility expense \$0.19 per sq. ft.
 - Building total sq. ft. 22,842

Source: BAE Urban Economics, 2012.

**Table 10: Depreciation Schedule & Residual Value: FTBL
001-02 Demolition and New Construction**

| Period | Depreciation Schedule | Residual Value |
|---------------|----------------------------------|---------------------------|
| 2012 | \$ - | \$ - |
| 2013 | \$ 7,974,342 | \$ - |
| 2014 | \$ 7,829,354 | \$ - |
| 2015 | \$ 7,684,366 | \$ - |
| 2016 | \$ 7,539,378 | \$ - |
| 2017 | \$ 7,394,390 | \$ - |
| 2018 | \$ 7,249,402 | \$ - |
| 2019 | \$ 7,104,414 | \$ - |
| 2020 | \$ 6,959,426 | \$ - |
| 2021 | \$ 6,814,438 | \$ - |
| 2022 | \$ 6,669,450 | \$ - |
| 2023 | \$ 6,524,462 | \$ - |
| 2024 | \$ 6,379,474 | \$ - |
| 2025 | \$ 6,234,486 | \$ - |
| 2026 | \$ 6,089,498 | \$ - |
| 2027 | \$ 5,944,510 | \$ - |
| 2028 | \$ 5,799,522 | \$ - |
| 2029 | \$ 5,654,534 | \$ - |
| 2030 | \$ 5,509,546 | \$ - |
| 2031 | \$ 5,364,558 | \$ - |
| 2032 | \$ 5,219,570 | \$ - |
| 2033 | \$ 5,074,582 | \$ - |
| 2034 | \$ 4,929,594 | \$ - |
| 2035 | \$ 4,784,605 | \$ - |
| 2036 | \$ 4,639,617 | \$ - |
| 2037 | \$ 4,494,629 | \$ - |
| 2038 | \$ 4,349,641 | \$ - |
| 2039 | \$ 4,204,653 | \$ - |
| 2040 | \$ 4,059,665 | \$ - |
| 2041 | \$ 3,914,677 | \$ - |
| 2042 | \$ 3,769,689 | \$ 3,769,689 |

Note:
Useful life of asset: 55.0 years

Source: BAE Urban Economics, Inc. 2012.

Table 11: NPV Calculation FTBL 001-03: Modernization with HPS

| Mid Year | One Time | | | | | | | Recurring | | | Residual Value | | Net Present Value | | | |
|---------------|------------------|---------------|----------------------|------------|------------|------------------|---------------------------|--------------|---------------------|------------------|----------------|------|-------------------|------------|----------------|--------------|
| | New Construction | Modernization | Temporary Facilities | Relocation | Demo | Site Preparation | Environmental Remediation | Utilities | Repairs Maintenance | Other Operations | Building | Land | Undiscounted Sum | NPV Factor | Mid-Year | Cum NPV |
| 2012 | \$ - | \$ - | \$ - | \$ - | \$ 467,586 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 467,586 | 0.99 | \$ 462,979 | \$ 462,979 |
| 2013 | \$ - | \$ 6,562,976 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 37,921 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 6,693,772 | 0.97 | \$ 6,497,864 | \$ 6,960,843 |
| 2014 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 37,921 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 130,795 | 0.95 | \$ 124,478 | \$ 7,085,321 |
| 2015 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 37,921 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 130,795 | 0.93 | \$ 122,037 | \$ 7,207,358 |
| 2016 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 37,921 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 130,795 | 0.91 | \$ 119,644 | \$ 7,327,002 |
| 2017 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 37,921 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 130,795 | 0.90 | \$ 117,298 | \$ 7,444,300 |
| 2018 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 37,921 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 130,795 | 0.88 | \$ 114,998 | \$ 7,559,298 |
| 2019 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 37,921 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 130,795 | 0.86 | \$ 112,743 | \$ 7,672,042 |
| 2020 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 37,921 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 130,795 | 0.85 | \$ 110,533 | \$ 7,782,574 |
| 2021 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 37,921 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 130,795 | 0.83 | \$ 108,365 | \$ 7,890,940 |
| 2022 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 37,921 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 130,795 | 0.81 | \$ 106,241 | \$ 7,997,180 |
| 2023 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 37,921 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 130,795 | 0.80 | \$ 104,157 | \$ 8,101,338 |
| 2024 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 37,921 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 130,795 | 0.78 | \$ 102,115 | \$ 8,203,453 |
| 2025 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 37,921 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 130,795 | 0.77 | \$ 100,113 | \$ 8,303,566 |
| 2026 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 37,921 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 130,795 | 0.75 | \$ 98,150 | \$ 8,401,715 |
| 2027 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 37,921 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 130,795 | 0.74 | \$ 96,225 | \$ 8,497,941 |
| 2028 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 37,921 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 130,795 | 0.72 | \$ 94,339 | \$ 8,592,279 |
| 2029 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 37,921 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 130,795 | 0.71 | \$ 92,489 | \$ 8,684,768 |
| 2030 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 37,921 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 130,795 | 0.69 | \$ 90,675 | \$ 8,775,443 |
| 2031 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 37,921 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 130,795 | 0.68 | \$ 88,897 | \$ 8,864,341 |
| 2032 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 37,921 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 130,795 | 0.67 | \$ 87,154 | \$ 8,951,495 |
| 2033 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 37,921 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 130,795 | 0.65 | \$ 85,445 | \$ 9,036,940 |
| 2034 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 37,921 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 130,795 | 0.64 | \$ 83,770 | \$ 9,120,710 |
| 2035 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 37,921 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 130,795 | 0.63 | \$ 82,127 | \$ 9,202,838 |
| 2036 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 37,921 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 130,795 | 0.62 | \$ 80,517 | \$ 9,283,355 |
| 2037 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 37,921 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 130,795 | 0.60 | \$ 78,938 | \$ 9,362,293 |
| 2038 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 37,921 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 130,795 | 0.59 | \$ 77,390 | \$ 9,439,683 |
| 2039 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 37,921 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 130,795 | 0.58 | \$ 75,873 | \$ 9,515,556 |
| 2040 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 37,921 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 130,795 | 0.57 | \$ 74,385 | \$ 9,589,942 |
| 2041 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 37,921 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 130,795 | 0.56 | \$ 72,927 | \$ 9,662,868 |
| 2042 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 37,921 | \$ 29,403 | \$ 63,472 | \$ (3,102,498) | \$ - | \$ (2,971,703) | 0.55 | \$ (1,624,427) | \$ 8,038,442 |
| TOTALS | \$ - | \$ 6,562,976 | \$ - | \$ - | \$ 467,586 | \$ - | \$ - | \$ 1,137,615 | \$ 882,077 | \$ 1,904,166 | \$ (3,102,498) | \$ - | \$ 7,851,923 | | \$ 8,038,442 | \$ 8,038,442 |

Notes:

Project Alternative Summary

| | |
|--------------------|----------------|
| Capital Costs | \$ 7,030,562 |
| Recurring Costs | \$ 3,923,858 |
| Residual Value | \$ (3,102,498) |
| Non Discounted Sum | \$ 7,851,923 |
| Cum NPV | \$ 8,038,442 |

Key Assumptions:

| | | | |
|-----------------------------|------------------|---------------------------------|---------|
| Discount Rate | 2.00% | Repairs and Maintenance | \$ 1.29 |
| Study Period | 30 years | Other Operations | \$ 2.78 |
| BaseYear | 2012 | Cleaning per sq. ft. | \$ 1.12 |
| Report Output | Constant Dollars | Roads and Grounds | \$ 0.27 |
| Cost per sq. ft. | \$308 | Administrative | \$ 1.39 |
| Construction Period (years) | 1 | BOMA Expense CPI Adjustment | 2.16% |
| Building Size (sq. ft.) | 22,842 | Effective utilities per sq. ft. | \$ 1.66 |

Not from BOMA; calculated based on option-specific energy usage.

Source: BAE Urban Economics, 2012.

Table 12: Schedule of Recurring Expenditures: FTBL 001-03 Modernization with HPS

| Year | Total Annual Expenditures | Electrical | | | Natural Gas | | | Water/Sewer (a) | | | | | |
|------|---------------------------|------------|---------|----------|-------------|-------|----------|-----------------|-------|---------|-------|---------|-------|
| | | Total Cost | kWh | \$/kWh | Total Cost | MMBtu | \$/MMBtu | Total Cost | Water | \$/Kgal | Waste | \$/Kgal | Other |
| 2012 | \$ 37,921 | \$ 33,487 | 558,113 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2013 | \$ 37,921 | \$ 33,487 | 558,113 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2014 | \$ 37,921 | \$ 33,487 | 558,113 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2015 | \$ 37,921 | \$ 33,487 | 558,113 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2016 | \$ 37,921 | \$ 33,487 | 558,113 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2017 | \$ 37,921 | \$ 33,487 | 558,113 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2018 | \$ 37,921 | \$ 33,487 | 558,113 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2019 | \$ 37,921 | \$ 33,487 | 558,113 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2020 | \$ 37,921 | \$ 33,487 | 558,113 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2021 | \$ 37,921 | \$ 33,487 | 558,113 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2022 | \$ 37,921 | \$ 33,487 | 558,113 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2023 | \$ 37,921 | \$ 33,487 | 558,113 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2024 | \$ 37,921 | \$ 33,487 | 558,113 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2025 | \$ 37,921 | \$ 33,487 | 558,113 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2026 | \$ 37,921 | \$ 33,487 | 558,113 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2027 | \$ 37,921 | \$ 33,487 | 558,113 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2028 | \$ 37,921 | \$ 33,487 | 558,113 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2029 | \$ 37,921 | \$ 33,487 | 558,113 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2030 | \$ 37,921 | \$ 33,487 | 558,113 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2031 | \$ 37,921 | \$ 33,487 | 558,113 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2032 | \$ 37,921 | \$ 33,487 | 558,113 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2033 | \$ 37,921 | \$ 33,487 | 558,113 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2034 | \$ 37,921 | \$ 33,487 | 558,113 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2035 | \$ 37,921 | \$ 33,487 | 558,113 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2036 | \$ 37,921 | \$ 33,487 | 558,113 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2037 | \$ 37,921 | \$ 33,487 | 558,113 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2038 | \$ 37,921 | \$ 33,487 | 558,113 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2039 | \$ 37,921 | \$ 33,487 | 558,113 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2040 | \$ 37,921 | \$ 33,487 | 558,113 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2041 | \$ 37,921 | \$ 33,487 | 558,113 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2042 | \$ 37,921 | \$ 33,487 | 558,113 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |

Notes:

(a) Water and sewer combined and calculated on square foot basis based upon BOMA ERR data.

| | |
|-----------------------------|---|
| CPI adjustment factor: | 2.16% bring 2011 BOMA ERR data to 2012 dollars. |
| Water/sewer utility expense | \$0.19 per sq. ft. |
| Building total sq. ft. | 22,842 |

Source: BAE Urban Economics, 2012.

**Table 13: Depreciation Schedule & Residual Value: FTBL
001-03 Modernization with HPS**

| Period | Depreciation Schedule | Residual Value |
|---------------|----------------------------------|---------------------------|
| 2012 | \$ - | \$ - |
| 2013 | \$ 6,562,976 | \$ - |
| 2014 | \$ 6,443,650 | \$ - |
| 2015 | \$ 6,324,323 | \$ - |
| 2016 | \$ 6,204,996 | \$ - |
| 2017 | \$ 6,085,669 | \$ - |
| 2018 | \$ 5,966,342 | \$ - |
| 2019 | \$ 5,847,015 | \$ - |
| 2020 | \$ 5,727,688 | \$ - |
| 2021 | \$ 5,608,362 | \$ - |
| 2022 | \$ 5,489,035 | \$ - |
| 2023 | \$ 5,369,708 | \$ - |
| 2024 | \$ 5,250,381 | \$ - |
| 2025 | \$ 5,131,054 | \$ - |
| 2026 | \$ 5,011,727 | \$ - |
| 2027 | \$ 4,892,401 | \$ - |
| 2028 | \$ 4,773,074 | \$ - |
| 2029 | \$ 4,653,747 | \$ - |
| 2030 | \$ 4,534,420 | \$ - |
| 2031 | \$ 4,415,093 | \$ - |
| 2032 | \$ 4,295,766 | \$ - |
| 2033 | \$ 4,176,439 | \$ - |
| 2034 | \$ 4,057,113 | \$ - |
| 2035 | \$ 3,937,786 | \$ - |
| 2036 | \$ 3,818,459 | \$ - |
| 2037 | \$ 3,699,132 | \$ - |
| 2038 | \$ 3,579,805 | \$ - |
| 2039 | \$ 3,460,478 | \$ - |
| 2040 | \$ 3,341,152 | \$ - |
| 2041 | \$ 3,221,825 | \$ - |
| 2042 | \$ 3,102,498 | \$ 3,102,498 |

Note:

Useful life of asset: 55.0 years

Source: BAE Urban Economics, Inc. 2012.

Table 14: NPV Calculation FTBL 001-04: Modernization with AT/FP

| Mid Year | One Time | | | | | | | Recurring | | | Residual Value | | Net Present Value | | | |
|----------|------------------|---------------|----------------------|------------|------------|------------------|---------------------------|--------------|---------------------|------------------|----------------|------|-------------------|------------|----------------|---------------|
| | New Construction | Modernization | Temporary Facilities | Relocation | Demo | Site Preparation | Environmental Remediation | Utilities | Repairs Maintenance | Other Operations | Building | Land | Undiscounted Sum | NPV Factor | Mid-Year | Cum NPV |
| 2012 | \$ - | \$ - | \$ - | \$ - | \$ 623,448 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 623,448 | 0.99 | \$ 617,305 | \$ 617,305 |
| 2013 | \$ - | \$ 7,015,635 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,262 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 7,146,772 | 0.97 | \$ 6,937,606 | \$ 7,554,912 |
| 2014 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,262 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,137 | 0.95 | \$ 124,803 | \$ 7,679,714 |
| 2015 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,262 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,137 | 0.93 | \$ 122,356 | \$ 7,802,070 |
| 2016 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,262 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,137 | 0.91 | \$ 119,956 | \$ 7,922,026 |
| 2017 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,262 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,137 | 0.90 | \$ 117,604 | \$ 8,039,631 |
| 2018 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,262 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,137 | 0.88 | \$ 115,298 | \$ 8,154,929 |
| 2019 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,262 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,137 | 0.86 | \$ 113,038 | \$ 8,267,967 |
| 2020 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,262 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,137 | 0.85 | \$ 110,821 | \$ 8,378,788 |
| 2021 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,262 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,137 | 0.83 | \$ 108,648 | \$ 8,487,436 |
| 2022 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,262 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,137 | 0.81 | \$ 106,518 | \$ 8,593,954 |
| 2023 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,262 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,137 | 0.80 | \$ 104,429 | \$ 8,698,384 |
| 2024 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,262 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,137 | 0.78 | \$ 102,382 | \$ 8,800,765 |
| 2025 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,262 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,137 | 0.77 | \$ 100,374 | \$ 8,901,139 |
| 2026 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,262 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,137 | 0.75 | \$ 98,406 | \$ 8,999,545 |
| 2027 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,262 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,137 | 0.74 | \$ 96,477 | \$ 9,096,022 |
| 2028 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,262 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,137 | 0.72 | \$ 94,585 | \$ 9,190,607 |
| 2029 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,262 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,137 | 0.71 | \$ 92,730 | \$ 9,283,337 |
| 2030 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,262 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,137 | 0.69 | \$ 90,912 | \$ 9,374,249 |
| 2031 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,262 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,137 | 0.68 | \$ 89,129 | \$ 9,463,378 |
| 2032 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,262 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,137 | 0.67 | \$ 87,382 | \$ 9,550,760 |
| 2033 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,262 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,137 | 0.65 | \$ 85,668 | \$ 9,636,429 |
| 2034 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,262 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,137 | 0.64 | \$ 83,989 | \$ 9,720,417 |
| 2035 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,262 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,137 | 0.63 | \$ 82,342 | \$ 9,802,759 |
| 2036 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,262 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,137 | 0.62 | \$ 80,727 | \$ 9,883,486 |
| 2037 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,262 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,137 | 0.60 | \$ 79,144 | \$ 9,962,631 |
| 2038 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,262 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,137 | 0.59 | \$ 77,593 | \$ 10,040,223 |
| 2039 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,262 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,137 | 0.58 | \$ 76,071 | \$ 10,116,294 |
| 2040 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,262 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,137 | 0.57 | \$ 74,580 | \$ 10,190,874 |
| 2041 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,262 | \$ 29,403 | \$ 63,472 | \$ - | \$ - | \$ 131,137 | 0.56 | \$ 73,117 | \$ 10,263,991 |
| 2042 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 38,262 | \$ 29,403 | \$ 63,472 | \$ (3,316,482) | \$ - | \$ (3,185,345) | 0.55 | \$ (1,741,211) | \$ 8,522,780 |
| TOTALS | \$ - | \$ 7,015,635 | \$ - | \$ - | \$ 623,448 | \$ - | \$ - | \$ 1,147,859 | \$ 882,077 | \$ 1,904,166 | \$ (3,316,482) | \$ - | \$ 8,256,703 | | \$ 8,522,780 | \$ 8,522,780 |

Notes:

Project Alternative Summary

| | |
|--------------------|----------------|
| Capital Costs | \$ 7,639,083 |
| Recurring Costs | \$ 3,934,102 |
| Residual Value | \$ (3,316,482) |
| Non Discounted Sum | \$ 8,256,703 |
| Cum NPV | \$ 8,522,780 |

Key Assumptions:

| | | | |
|-----------------------------|------------------|---------------------------------|--|
| Discount Rate | 2.00% | Repairs and Maintenance | \$ 1.29 |
| Study Period | 30 years | Other Operations | \$ 2.78 |
| Base Year | 2012 | Cleaning per sq. ft. | \$ 1.12 |
| Report Output | Constant Dollars | Roads and Grounds | \$ 0.27 |
| Cost per sq. ft. | \$334 | Administrative | \$ 1.39 |
| Construction Period (years) | 1 | BOMA Expense CPI Adjustment | 2.16% |
| Building Size (sq. ft.) | 22,842 | Effective utilities per sq. ft. | \$ 1.68 Not from BOMA; calculated based on option-specific energy usage. |

Source: BAE Urban Economics, 2012.

Table 15: Schedule of Recurring Expenditures: FTBL 001-04 Modernization with AT/FP

| Year | Total Annual Expenditures | Electrical | | | Natural Gas | | | Water/Sewer (a) | | | | Other | |
|------|---------------------------|------------|---------|----------|-------------|------|----------|-----------------|-------|---------|-------|-------|---------|
| | | Total Cost | kWh | \$/kWh | Total Cost | MMBt | \$/MMBtu | Total Cost | Water | \$/Kgal | Waste | | \$/Kgal |
| 2012 | \$ 38,262 | \$ 33,828 | 563,804 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2013 | \$ 38,262 | \$ 33,828 | 563,804 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2014 | \$ 38,262 | \$ 33,828 | 563,804 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2015 | \$ 38,262 | \$ 33,828 | 563,804 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2016 | \$ 38,262 | \$ 33,828 | 563,804 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2017 | \$ 38,262 | \$ 33,828 | 563,804 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2018 | \$ 38,262 | \$ 33,828 | 563,804 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2019 | \$ 38,262 | \$ 33,828 | 563,804 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2020 | \$ 38,262 | \$ 33,828 | 563,804 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2021 | \$ 38,262 | \$ 33,828 | 563,804 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2022 | \$ 38,262 | \$ 33,828 | 563,804 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2023 | \$ 38,262 | \$ 33,828 | 563,804 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2024 | \$ 38,262 | \$ 33,828 | 563,804 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2025 | \$ 38,262 | \$ 33,828 | 563,804 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2026 | \$ 38,262 | \$ 33,828 | 563,804 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2027 | \$ 38,262 | \$ 33,828 | 563,804 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2028 | \$ 38,262 | \$ 33,828 | 563,804 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2029 | \$ 38,262 | \$ 33,828 | 563,804 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2030 | \$ 38,262 | \$ 33,828 | 563,804 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2031 | \$ 38,262 | \$ 33,828 | 563,804 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2032 | \$ 38,262 | \$ 33,828 | 563,804 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2033 | \$ 38,262 | \$ 33,828 | 563,804 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2034 | \$ 38,262 | \$ 33,828 | 563,804 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2035 | \$ 38,262 | \$ 33,828 | 563,804 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2036 | \$ 38,262 | \$ 33,828 | 563,804 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2037 | \$ 38,262 | \$ 33,828 | 563,804 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2038 | \$ 38,262 | \$ 33,828 | 563,804 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2039 | \$ 38,262 | \$ 33,828 | 563,804 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2040 | \$ 38,262 | \$ 33,828 | 563,804 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2041 | \$ 38,262 | \$ 33,828 | 563,804 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |
| 2042 | \$ 38,262 | \$ 33,828 | 563,804 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 4,434 | | | | | \$ - |

Notes:

- (a) Water and sewer combined and calculated on square foot basis based upon BOMA ERR data.
 - CPI adjustment factor: 2.16% bring 2011 BOMA ERR data to 2012 dollars.
 - Water/sewer utility expense \$0.19 per sq. ft.
 - Building total sq. ft. 22,842

Source: BAE Urban Economics, 2012.

**Table 16: Depreciation Schedule & Residual Value: FTBL
001-04 Modernization with AT/FP**

| Period | Depreciation Schedule | Residual Value |
|---------------|----------------------------------|---------------------------|
| 2012 | \$ - | \$ - |
| 2013 | \$ 7,015,635 | \$ - |
| 2014 | \$ 6,888,078 | \$ - |
| 2015 | \$ 6,760,521 | \$ - |
| 2016 | \$ 6,632,964 | \$ - |
| 2017 | \$ 6,505,407 | \$ - |
| 2018 | \$ 6,377,850 | \$ - |
| 2019 | \$ 6,250,293 | \$ - |
| 2020 | \$ 6,122,736 | \$ - |
| 2021 | \$ 5,995,179 | \$ - |
| 2022 | \$ 5,867,622 | \$ - |
| 2023 | \$ 5,740,065 | \$ - |
| 2024 | \$ 5,612,508 | \$ - |
| 2025 | \$ 5,484,951 | \$ - |
| 2026 | \$ 5,357,394 | \$ - |
| 2027 | \$ 5,229,837 | \$ - |
| 2028 | \$ 5,102,280 | \$ - |
| 2029 | \$ 4,974,723 | \$ - |
| 2030 | \$ 4,847,166 | \$ - |
| 2031 | \$ 4,719,609 | \$ - |
| 2032 | \$ 4,592,052 | \$ - |
| 2033 | \$ 4,464,495 | \$ - |
| 2034 | \$ 4,336,938 | \$ - |
| 2035 | \$ 4,209,381 | \$ - |
| 2036 | \$ 4,081,824 | \$ - |
| 2037 | \$ 3,954,267 | \$ - |
| 2038 | \$ 3,826,710 | \$ - |
| 2039 | \$ 3,699,153 | \$ - |
| 2040 | \$ 3,571,596 | \$ - |
| 2041 | \$ 3,444,039 | \$ - |
| 2042 | \$ 3,316,482 | \$ 3,316,482 |

Note:

Useful life of asset: 55.0 years

Source: BAE Urban Economics, Inc. 2012.

Table 17: South U.S. Urban Consumer Price Index

| Year | Index (1982=100) | Annual CPI % Change |
|-------------|-----------------------------|--------------------------------|
| 1993 | 140.80 | 3.15% |
| 1994 | 144.70 | 2.77% |
| 1995 | 149.00 | 2.97% |
| 1996 | 153.60 | 3.09% |
| 1997 | 156.90 | 2.15% |
| 1998 | 158.90 | 1.27% |
| 1999 | 162.00 | 1.95% |
| 2000 | 167.20 | 3.21% |
| 2001 | 171.10 | 2.33% |
| 2002 | 173.30 | 1.29% |
| 2003 | 177.30 | 2.31% |
| 2004 | 181.80 | 2.54% |
| 2005 | 188.30 | 3.58% |
| 2006 | 194.70 | 3.40% |
| 2007 | 200.36 | 2.91% |
| 2008 | 208.68 | 4.15% |
| 2009 | 207.85 | -0.40% |
| 2010 | 211.34 | 1.68% |
| 2011 | 218.62 | 3.44% |
| 2012 | 223.34 | 2.16% |

Annual Average**20-years: 2.5%****LCCA Assumption: 0.0%**

Source: U.S. Department of Labor, Bureau of Labor Statistics;
BAE Urban Economics, Inc. 2012.

Table 18: Discount Rates and Factors

| Year | Discount Factors | | Beginning of Year | Calander Year |
|------|------------------|----------|----------------------|------------------|
| | End of Year | Mid-Year | | |
| 1 | 0.9804 | 0.9901 | 1.0000 | 2012 |
| 2 | 0.9612 | 0.9707 | 0.9804 | 2013 |
| 3 | 0.9423 | 0.9517 | 0.9612 | 2014 |
| 4 | 0.9238 | 0.9330 | 0.9423 | 2015 |
| 5 | 0.9057 | 0.9147 | 0.9238 | 2016 |
| 6 | 0.8880 | 0.8968 | 0.9057 | 2017 |
| 7 | 0.8706 | 0.8792 | 0.8880 | 2018 |
| 8 | 0.8535 | 0.8620 | 0.8706 | 2019 |
| 9 | 0.8368 | 0.8451 | 0.8535 | 2020 |
| 10 | 0.8203 | 0.8285 | 0.8368 | 2021 |
| 11 | 0.8043 | 0.8123 | 0.8203 | 2022 |
| 12 | 0.7885 | 0.7963 | 0.8043 | 2023 |
| 13 | 0.7730 | 0.7807 | 0.7885 | 2024 |
| 14 | 0.7579 | 0.7654 | 0.7730 | 2025 |
| 15 | 0.7430 | 0.7504 | 0.7579 | 2026 |
| 16 | 0.7284 | 0.7357 | 0.7430 | 2027 |
| 17 | 0.7142 | 0.7213 | 0.7284 | 2028 |
| 18 | 0.7002 | 0.7071 | 0.7142 | 2029 |
| 19 | 0.6864 | 0.6933 | 0.7002 | 2030 |
| 20 | 0.6730 | 0.6797 | 0.6864 | 2031 |
| 21 | 0.6598 | 0.6663 | 0.6730 | 2032 |
| 22 | 0.6468 | 0.6533 | 0.6598 | 2033 |
| 23 | 0.6342 | 0.6405 | 0.6468 | 2034 |
| 24 | 0.6217 | 0.6279 | 0.6342 | 2035 |
| 25 | 0.6095 | 0.6156 | 0.6217 | 2036 |
| 26 | 0.5976 | 0.6035 | 0.6095 | 2037 |
| 27 | 0.5859 | 0.5917 | 0.5976 | 2038 |
| 28 | 0.5744 | 0.5801 | 0.5859 | 2039 |
| 29 | 0.5631 | 0.5687 | 0.5744 | 2040 |
| 30 | 0.5521 | 0.5576 | 0.5631 | 2041 |
| 31 | 0.5412 | 0.5466 | 0.5521 | 2042 |

Notes:

30-Year real discount rate 2.0%

Mid-year factor: 1.0100

Sources: Office of Management and Budget, OMB Circular A-94,
Appendix C; BAE Urban Economics, 2012.

Life Cycle Cost Analysis (LCCA) Spreadsheet

Fort Bliss, El Paso TX

**ESTCP SI 0931
LCCA Demonstration**

Historic Building 115

Mission: General Administrative Office

Prepared by:
BAE Urban Economics, Inc.

December 2012

Table III-15: Life Cycle Cost Analysis Summary: FTBL 115

| Project Alternative | Non Discounted Costs by Component | | | Total Costs | | |
|--|-----------------------------------|--------------|----------------|----------------|----------------------------|---------------------------|
| | Initial Investment | Recurring | Residual Value | Non Discounted | Discounted - No GHG Factor | Discounted - w/GHG Factor |
| FTBL 115-01: Sustainment-Status Quo | \$ 613,479 | \$ 1,695,225 | \$ - | \$ 2,308,704 | \$ 1,848,623 | \$ 1,957,488 |
| FTBL 115-02: Demolition and New Construction | \$ 5,166,222 | \$ 1,480,271 | \$ (2,300,273) | \$ 4,346,220 | \$ 4,857,655 | \$ 4,956,278 |
| FTBL 115-03: Modernization with HPS | \$ 3,625,554 | \$ 1,477,960 | \$ (1,645,759) | \$ 3,457,755 | \$ 3,715,117 | \$ 3,791,391 |
| FTBL 115-04: Modernization with AT/FP | \$ 3,905,689 | \$ 1,478,874 | \$ (1,755,478) | \$ 3,629,085 | \$ 3,928,686 | \$ 4,009,546 |

NOTES:

| | |
|--------------------------------------|----------|
| Study Period (years): | 30 |
| Real Discount Rate: | 2.00% |
| Average CO2e Value/MT (undiscounted) | \$ 37.36 |
| Base Date: | 10/01/12 |

Sources: Preservation Associates; BAE Urban Economics, 2012.

Table III-16: Greenhouse Gas Valuation Summary: FTBL 115

| Project Alternative | GHG Emissions by Scope (MT CO2e) | | | | GHG Value | |
|--|----------------------------------|----------|----------|----------|----------------|------------|
| | Scope 1 | Scope 2 | Scope 3 | Total | Non Discounted | Discounted |
| FTBL 115-01: Sustainment-Status Quo | - | 4,120.90 | 72.44 | 4,193.34 | \$ 156,646 | \$ 108,865 |
| FTBL 115-02: Demolition and New Construction | - | 2,349.82 | 1,009.51 | 3,359.33 | \$ 125,068 | \$ 98,622 |
| FTBL 115-03: Modernization with HPS | - | 2,330.77 | 443.09 | 2,773.86 | \$ 103,444 | \$ 76,274 |
| FTBL 115-04: Modernization with AT/FP | - | 2,338.31 | 530.26 | 2,868.57 | \$ 106,944 | \$ 80,860 |

Notes:

| | |
|--------------------------------------|----------|
| Study Period (years): | 30 |
| Real Discount Rate: | 2.00% |
| Average CO2e Value/MT (undiscounted) | \$ 37.36 |
| Base Date: | 10/01/12 |

Sources: Center for Resource Solutions; BAE Urban Economics, 2012.

Table 3: Alternatives Summary: FTBL 115

| Project Alternative | Building GSF | | Building Features | | Construction Cost | |
|--|---------------------|------------------|--------------------------|--------------|--------------------------|---------------|
| | Total | Footprint | LEED | AT/FP | Total | Per SF |
| FTBL 115-01: Sustainment-Status Quo | 9,351 | 5,700 | n/a | No | \$ 613,479 | \$ 66 |
| FTBL 115-02: Demolition and New Construction | 9,351 | 5,700 | 52 | Yes | \$ 5,166,222 | \$ 552 |
| FTBL 115-03: Modernization with HPS | 9,351 | 5,700 | 54 | Yes | \$ 3,625,554 | \$ 388 |
| FTBL 115-04: Modernization with AT/FP | 9,351 | 5,700 | 54 | Yes+ | \$ 3,905,689 | \$ 418 |

Note:

Table 4: Construction Cost Summary: FTBL 115

| Cost Estimate | | | | |
|--------------------------------|--|--|---|---|
| Category | 01. Sustainment- Status Quo | 02. Demolition and New Construction | 03. Modernization with HPS | 04. Modernization with AT/FP |
| Demolition | \$ - | \$ 300,261 | \$ 144,142 | \$ 192,178 |
| Substructure | \$ 39,040 | \$ 301,890 | \$ 13,040 | \$ 13,040 |
| Shell | \$ 188,982 | \$ 1,345,742 | \$ 707,346 | \$ 855,655 |
| Interiors | \$ 76,815 | \$ 172,760 | \$ 131,440 | \$ 140,104 |
| Services | \$ 130,640 | \$ 1,172,127 | \$ 1,188,715 | \$ 1,174,583 |
| Sitework | \$ - | \$ 305,088 | \$ 338,584 | \$ 343,702 |
| Special Construction | \$ - | \$ 9,333 | \$ 9,333 | \$ 9,333 |
| Hard cost subtotal | \$ 435,477 | \$ 3,607,201 | \$ 2,532,599 | \$ 2,728,596 |
| General conditions (25%) | \$ 108,869 | \$ 916,810 | \$ 643,399 | \$ 693,113 |
| Security escalation (2%) | \$ - | \$ 60,037 | \$ 40,997 | \$ 43,854 |
| USACE design (7%) | \$ 38,104 | \$ 320,883 | \$ 225,190 | \$ 242,589 |
| USACE SOIH (5.7%) | \$ 31,028 | \$ 261,291 | \$ 183,369 | \$ 197,537 |
| Soft cost subtotal | \$ 178,001 | \$ 1,559,021 | \$ 1,092,955 | \$ 1,177,093 |
| Construction cost total | \$ 613,479 | \$ 5,166,222 | \$ 3,625,554 | \$ 3,905,689 |
| Construction cost PSF | \$ 66 | \$ 552 | \$ 388 | \$ 418 |
| % Difference from 02 | -88% | N/A | -30% | -24% |

Sources: Preservation Associates; BAE Urban Economics Inc. 2012.

Table 5: NPV Calculation 001-01: Sustainment-Status Quo

| Mid Year | One Time | | | | | | | Recurring | | | Residual Value | | Net Present Value | | | |
|---------------|------------------|-------------|----------------------|------------|------|------------------|---------------------------|------------|---------------------|------------------|----------------|------|-------------------|------------|--------------|--------------|
| | New Construction | Sustainment | Temporary Facilities | Relocation | Demo | Site Preparation | Environmental Remediation | Utilities | Repairs Maintenance | Other Operations | Building | Land | Undiscounted Sum | NPV Factor | Mid-Year | Cum NPV |
| 2012 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | 0.99 | \$ - | \$ - |
| 2013 | \$ - | \$ 613,479 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 18,487 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 669,986 | 0.97 | \$ 650,378 | \$ 650,378 |
| 2014 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 18,487 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 56,508 | 0.95 | \$ 53,778 | \$ 704,156 |
| 2015 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 18,487 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 56,508 | 0.93 | \$ 52,724 | \$ 756,879 |
| 2016 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 18,487 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 56,508 | 0.91 | \$ 51,690 | \$ 808,569 |
| 2017 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 18,487 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 56,508 | 0.90 | \$ 50,676 | \$ 859,246 |
| 2018 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 18,487 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 56,508 | 0.88 | \$ 49,683 | \$ 908,928 |
| 2019 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 18,487 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 56,508 | 0.86 | \$ 48,709 | \$ 957,637 |
| 2020 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 18,487 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 56,508 | 0.85 | \$ 47,753 | \$ 1,005,390 |
| 2021 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 18,487 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 56,508 | 0.83 | \$ 46,817 | \$ 1,052,207 |
| 2022 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 18,487 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 56,508 | 0.81 | \$ 45,899 | \$ 1,098,107 |
| 2023 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 18,487 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 56,508 | 0.80 | \$ 44,999 | \$ 1,143,106 |
| 2024 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 18,487 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 56,508 | 0.78 | \$ 44,117 | \$ 1,187,222 |
| 2025 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 18,487 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 56,508 | 0.77 | \$ 43,252 | \$ 1,230,474 |
| 2026 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 18,487 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 56,508 | 0.75 | \$ 42,404 | \$ 1,272,878 |
| 2027 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 18,487 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 56,508 | 0.74 | \$ 41,572 | \$ 1,314,450 |
| 2028 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 18,487 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 56,508 | 0.72 | \$ 40,757 | \$ 1,355,207 |
| 2029 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 18,487 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 56,508 | 0.71 | \$ 39,958 | \$ 1,395,165 |
| 2030 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 18,487 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 56,508 | 0.69 | \$ 39,174 | \$ 1,434,340 |
| 2031 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 18,487 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 56,508 | 0.68 | \$ 38,406 | \$ 1,472,746 |
| 2032 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 18,487 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 56,508 | 0.67 | \$ 37,653 | \$ 1,510,399 |
| 2033 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 18,487 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 56,508 | 0.65 | \$ 36,915 | \$ 1,547,314 |
| 2034 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 18,487 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 56,508 | 0.64 | \$ 36,191 | \$ 1,583,505 |
| 2035 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 18,487 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 56,508 | 0.63 | \$ 35,482 | \$ 1,618,987 |
| 2036 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 18,487 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 56,508 | 0.62 | \$ 34,786 | \$ 1,653,773 |
| 2037 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 18,487 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 56,508 | 0.60 | \$ 34,104 | \$ 1,687,876 |
| 2038 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 18,487 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 56,508 | 0.59 | \$ 33,435 | \$ 1,721,311 |
| 2039 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 18,487 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 56,508 | 0.58 | \$ 32,779 | \$ 1,754,091 |
| 2040 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 18,487 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 56,508 | 0.57 | \$ 32,137 | \$ 1,786,228 |
| 2041 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 18,487 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 56,508 | 0.56 | \$ 31,507 | \$ 1,817,734 |
| 2042 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 18,487 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 56,508 | 0.55 | \$ 30,889 | \$ 1,848,623 |
| TOTALS | \$ - | \$ 613,479 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 554,600 | \$ 361,102 | \$ 779,523 | \$ - | \$ - | \$ 2,308,704 | | \$ 1,848,623 | \$ 1,848,623 |

Notes:

Project Alternative Summary

| | |
|--------------------|--------------|
| Capital Costs | \$ 613,479 |
| Recurring Costs | \$ 1,695,225 |
| Residual Value | \$ - |
| Non Discounted Sum | \$ 2,308,704 |
| Cum NPV | \$ 1,848,623 |

Key Assumptions:

| | | | |
|-----------------------------|------------------|---------------------------------|---|
| Discount Rate | 2.00% | Repairs and Maintenance | \$ 1.29 |
| Study Period | 30 years | Other Operations | \$ 2.78 |
| Base Year | 2012 | Cleaning per sq. ft. | \$ 1.12 |
| Report Output | Constant Dollars | Roads and Grounds | \$ 0.27 |
| Cost per sq. ft. | \$66 | Administrative | \$ 1.39 |
| Construction Period (years) | 1 | BOMA Expense CPI Adjustment | 2.16% |
| Building Size (sq. ft.) | 9,351 | Effective utilities per sq. ft. | \$ 1.98 Not from BOMA; calculated based on treatment specific energy usage. |

Source: BAE Urban Economics, 2012.

Table 6: Schedule of Recurring Expenditures: FTBL 115-01 Sustainment -Status Quo

| Year | Total Annual Expenditures | Electrical | | | Natural Gas | | | Water/Sewer (a) | | | | Other | |
|------|---------------------------|------------|---------|----------|-------------|-------|----------|-----------------|-------|---------|-------|-------|---------|
| | | Total Cost | kWh | \$/kWh | Total Cost | MMBtu | \$/MMBtu | Total Cost | Water | \$/Kgal | Waste | | \$/Kgal |
| 2012 | \$ 1,815 | \$ - | | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2013 | \$ 18,487 | \$ 16,672 | 277,860 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2014 | \$ 18,487 | \$ 16,672 | 277,860 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2015 | \$ 18,487 | \$ 16,672 | 277,860 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2016 | \$ 18,487 | \$ 16,672 | 277,860 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2017 | \$ 18,487 | \$ 16,672 | 277,860 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2018 | \$ 18,487 | \$ 16,672 | 277,860 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2019 | \$ 18,487 | \$ 16,672 | 277,860 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2020 | \$ 18,487 | \$ 16,672 | 277,860 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2021 | \$ 18,487 | \$ 16,672 | 277,860 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2022 | \$ 18,487 | \$ 16,672 | 277,860 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2023 | \$ 18,487 | \$ 16,672 | 277,860 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2024 | \$ 18,487 | \$ 16,672 | 277,860 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2025 | \$ 18,487 | \$ 16,672 | 277,860 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2026 | \$ 18,487 | \$ 16,672 | 277,860 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2027 | \$ 18,487 | \$ 16,672 | 277,860 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2028 | \$ 18,487 | \$ 16,672 | 277,860 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2029 | \$ 18,487 | \$ 16,672 | 277,860 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2030 | \$ 18,487 | \$ 16,672 | 277,860 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2031 | \$ 18,487 | \$ 16,672 | 277,860 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2032 | \$ 18,487 | \$ 16,672 | 277,860 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2033 | \$ 18,487 | \$ 16,672 | 277,860 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2034 | \$ 18,487 | \$ 16,672 | 277,860 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2035 | \$ 18,487 | \$ 16,672 | 277,860 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2036 | \$ 18,487 | \$ 16,672 | 277,860 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2037 | \$ 18,487 | \$ 16,672 | 277,860 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2038 | \$ 18,487 | \$ 16,672 | 277,860 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2039 | \$ 18,487 | \$ 16,672 | 277,860 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2040 | \$ 18,487 | \$ 16,672 | 277,860 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2041 | \$ 18,487 | \$ 16,672 | 277,860 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2042 | \$ 18,487 | \$ 16,672 | 277,860 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |

Notes:

- (a) Water and sewer combined and calculated on square foot basis based upon BOMA ERR data.
 - CPI adjustment factor: 2.16% bring 2011 BOMA ERR data to 2012 dollars.
 - Water/sewer utility expense \$0.19 per sq. ft.
 - Building total sq. ft. 9,351

Source: BAE Urban Economics, 2012.

**Table 7: Depreciation Schedule & Residual Value FTBL
115-01 Sustainment-Status Quo**

| Period | Depreciation Schedule | Residual Value |
|---------------|----------------------------------|---------------------------|
| 2012 | \$ - | \$ - |
| 2013 | \$ 613,479 | \$ - |
| 2014 | \$ 572,580 | \$ - |
| 2015 | \$ 531,682 | \$ - |
| 2016 | \$ 490,783 | \$ - |
| 2017 | \$ 449,884 | \$ - |
| 2018 | \$ 408,986 | \$ - |
| 2019 | \$ 368,087 | \$ - |
| 2020 | \$ 327,189 | \$ - |
| 2021 | \$ 286,290 | \$ - |
| 2022 | \$ 245,391 | \$ - |
| 2023 | \$ 204,493 | \$ - |
| 2024 | \$ 163,594 | \$ - |
| 2025 | \$ 122,696 | \$ - |
| 2026 | \$ 81,797 | \$ - |
| 2027 | \$ 40,899 | \$ - |
| 2028 | \$ - | \$ - |
| 2029 | \$ - | \$ - |
| 2030 | \$ - | \$ - |
| 2031 | \$ - | \$ - |
| 2032 | \$ - | \$ - |
| 2033 | \$ - | \$ - |
| 2034 | \$ - | \$ - |
| 2035 | \$ - | \$ - |
| 2036 | \$ - | \$ - |
| 2037 | \$ - | \$ - |
| 2038 | \$ - | \$ - |
| 2039 | \$ - | \$ - |
| 2040 | \$ - | \$ - |
| 2041 | \$ - | \$ - |
| 2042 | \$ - | \$ - |

Note:

Useful life of asset: 15.0 years

Source: BAE Urban Economics, Inc. 2012.

Table 8: NPV Calculation 115-02: Demolition and New Construction

| Mid Year | One Time | | | | | | | Recurring | | | Residual Value | | Net Present Value | | | |
|---------------|---------------------|---------------|----------------------|-------------|-------------------|------------------|---------------------------|-------------------|---------------------|-------------------|-----------------------|-------------|---------------------|------------|---------------------|---------------------|
| | New Construction | Modernization | Temporary Facilities | Relocation | Demo | Site Preparation | Environmental Remediation | Utilities | Repairs Maintenance | Other Operations | Building | Land | Undiscounted Sum | NPV Factor | Mid-Year | Cum NPV |
| 2012 | \$ - | \$ - | \$ - | \$ - | \$ 300,261 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 300,261 | 0.99 | \$ 297,302 | \$ 297,302 |
| 2013 | \$ 4,865,961 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,322 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 4,915,304 | 0.97 | \$ 4,771,447 | \$ 5,068,749 |
| 2014 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,322 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,342 | 0.95 | \$ 46,959 | \$ 5,115,708 |
| 2015 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,322 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,342 | 0.93 | \$ 46,038 | \$ 5,161,746 |
| 2016 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,322 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,342 | 0.91 | \$ 45,136 | \$ 5,206,882 |
| 2017 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,322 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,342 | 0.90 | \$ 44,251 | \$ 5,251,133 |
| 2018 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,322 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,342 | 0.88 | \$ 43,383 | \$ 5,294,516 |
| 2019 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,322 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,342 | 0.86 | \$ 42,532 | \$ 5,337,048 |
| 2020 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,322 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,342 | 0.85 | \$ 41,698 | \$ 5,378,746 |
| 2021 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,322 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,342 | 0.83 | \$ 40,881 | \$ 5,419,627 |
| 2022 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,322 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,342 | 0.81 | \$ 40,079 | \$ 5,459,706 |
| 2023 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,322 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,342 | 0.80 | \$ 39,293 | \$ 5,498,999 |
| 2024 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,322 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,342 | 0.78 | \$ 38,523 | \$ 5,537,522 |
| 2025 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,322 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,342 | 0.77 | \$ 37,767 | \$ 5,575,290 |
| 2026 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,322 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,342 | 0.75 | \$ 37,027 | \$ 5,612,316 |
| 2027 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,322 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,342 | 0.74 | \$ 36,301 | \$ 5,648,617 |
| 2028 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,322 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,342 | 0.72 | \$ 35,589 | \$ 5,684,206 |
| 2029 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,322 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,342 | 0.71 | \$ 34,891 | \$ 5,719,098 |
| 2030 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,322 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,342 | 0.69 | \$ 34,207 | \$ 5,753,305 |
| 2031 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,322 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,342 | 0.68 | \$ 33,536 | \$ 5,786,841 |
| 2032 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,322 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,342 | 0.67 | \$ 32,879 | \$ 5,819,720 |
| 2033 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,322 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,342 | 0.65 | \$ 32,234 | \$ 5,851,954 |
| 2034 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,322 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,342 | 0.64 | \$ 31,602 | \$ 5,883,556 |
| 2035 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,322 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,342 | 0.63 | \$ 30,982 | \$ 5,914,539 |
| 2036 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,322 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,342 | 0.62 | \$ 30,375 | \$ 5,944,914 |
| 2037 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,322 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,342 | 0.60 | \$ 29,779 | \$ 5,974,693 |
| 2038 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,322 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,342 | 0.59 | \$ 29,195 | \$ 6,003,889 |
| 2039 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,322 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,342 | 0.58 | \$ 28,623 | \$ 6,032,512 |
| 2040 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,322 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,342 | 0.57 | \$ 28,062 | \$ 6,060,573 |
| 2041 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,322 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,342 | 0.56 | \$ 27,512 | \$ 6,088,085 |
| 2042 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,322 | \$ 12,037 | \$ 25,984 | \$ (2,300,273) | \$ - | \$ (2,250,930) | 0.55 | \$ (1,230,430) | \$ 4,857,655 |
| TOTALS | \$ 4,865,961 | \$ - | \$ - | \$ - | \$ 300,261 | \$ - | \$ - | \$ 339,646 | \$ 361,102 | \$ 779,523 | \$ (2,300,273) | \$ - | \$ 4,346,220 | | \$ 4,857,655 | \$ 4,857,655 |

Notes:

Alternative 1 Summary:

| | |
|--------------------|----------------|
| Capital Costs | \$ 5,166,222 |
| Recurring Costs | \$ 1,480,271 |
| Residual Value | \$ (2,300,273) |
| Non Discounted Sum | \$ 4,346,220 |
| Cum NPV | \$ 4,857,655 |

Key Assumptions:

| | | | |
|-----------------------------|------------------|---------------------------------|---|
| Discount Rate | 2.00% | Repairs and Maintenance | \$ 1.29 |
| Study Period | 25 years | Other Operations | \$ 2.78 |
| BaseYear | 2012 | Cleaning per sq. ft. | \$ 1.12 |
| Report Output | Constant Dollars | Roads and Grounds | \$ 0.27 |
| Cost per sq. ft. | \$0 | Administrative | \$ 1.39 |
| Construction Period (years) | 1 | BOMA Expense CPI Adjustment | 2.16% |
| Building Size (sq. ft.) | 9,351 | Effective utilities per sq. ft. | \$ 1.21 Not from BOMA; calculated based on treatment specific energy usage. |

Source: BAE Urban Economics, 2012.

Table 9: Schedule of Recurring Expenditures: FTBL 115-02 Demolition and New Construction

| Year | Total Annual Expenditures | Electrical | | | Natural Gas | | | Water/Sewer (a) | | | | | |
|------|---------------------------|------------|---------|----------|-------------|-------|----------|-----------------|-------|---------|-------|---------|-------|
| | | Total Cost | kWh | \$/kWh | Total Cost | MMBtu | \$/MMBtu | Total Cost | Water | \$/Kgal | Waste | \$/Kgal | Other |
| 2012 | \$ 1,815 | \$ - | | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2013 | \$ 11,322 | \$ 9,506 | 158,441 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2014 | \$ 11,322 | \$ 9,506 | 158,441 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2015 | \$ 11,322 | \$ 9,506 | 158,441 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2016 | \$ 11,322 | \$ 9,506 | 158,441 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2017 | \$ 11,322 | \$ 9,506 | 158,441 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2018 | \$ 11,322 | \$ 9,506 | 158,441 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2019 | \$ 11,322 | \$ 9,506 | 158,441 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2020 | \$ 11,322 | \$ 9,506 | 158,441 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2021 | \$ 11,322 | \$ 9,506 | 158,441 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2022 | \$ 11,322 | \$ 9,506 | 158,441 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2023 | \$ 11,322 | \$ 9,506 | 158,441 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2024 | \$ 11,322 | \$ 9,506 | 158,441 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2025 | \$ 11,322 | \$ 9,506 | 158,441 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2026 | \$ 11,322 | \$ 9,506 | 158,441 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2027 | \$ 11,322 | \$ 9,506 | 158,441 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2028 | \$ 11,322 | \$ 9,506 | 158,441 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2029 | \$ 11,322 | \$ 9,506 | 158,441 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2030 | \$ 11,322 | \$ 9,506 | 158,441 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2031 | \$ 11,322 | \$ 9,506 | 158,441 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2032 | \$ 11,322 | \$ 9,506 | 158,441 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2033 | \$ 11,322 | \$ 9,506 | 158,441 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2034 | \$ 11,322 | \$ 9,506 | 158,441 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2035 | \$ 11,322 | \$ 9,506 | 158,441 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2036 | \$ 11,322 | \$ 9,506 | 158,441 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2037 | \$ 11,322 | \$ 9,506 | 158,441 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2038 | \$ 11,322 | \$ 9,506 | 158,441 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2039 | \$ 11,322 | \$ 9,506 | 158,441 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2040 | \$ 11,322 | \$ 9,506 | 158,441 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2041 | \$ 11,322 | \$ 9,506 | 158,441 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2042 | \$ 11,322 | \$ 9,506 | 158,441 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |

Notes:

- (a) Water and sewer combined and calculated on square foot basis based upon BOMA ERR data.
 - CPI adjustment factor: 2.16% bring 2011 BOMA ERR data to 2012 dollars.
 - Water/sewer utility expense \$0.19 per sq. ft.
 - Building total sq. ft. 9,351

Source: BAE Urban Economics, 2012.

**Table 10: Depreciation Schedule & Residual Value FTBL
115-02 Demolition and New Construction**

| Period | Depreciation Schedule | Residual Value |
|---------------|----------------------------------|---------------------------|
| 2012 | \$ - | \$ - |
| 2013 | \$ 4,865,961 | \$ - |
| 2014 | \$ 4,777,489 | \$ - |
| 2015 | \$ 4,689,017 | \$ - |
| 2016 | \$ 4,600,545 | \$ - |
| 2017 | \$ 4,512,073 | \$ - |
| 2018 | \$ 4,423,601 | \$ - |
| 2019 | \$ 4,335,129 | \$ - |
| 2020 | \$ 4,246,657 | \$ - |
| 2021 | \$ 4,158,185 | \$ - |
| 2022 | \$ 4,069,713 | \$ - |
| 2023 | \$ 3,981,241 | \$ - |
| 2024 | \$ 3,892,769 | \$ - |
| 2025 | \$ 3,804,297 | \$ - |
| 2026 | \$ 3,715,825 | \$ - |
| 2027 | \$ 3,627,353 | \$ - |
| 2028 | \$ 3,538,881 | \$ - |
| 2029 | \$ 3,450,409 | \$ - |
| 2030 | \$ 3,361,937 | \$ - |
| 2031 | \$ 3,273,465 | \$ - |
| 2032 | \$ 3,184,993 | \$ - |
| 2033 | \$ 3,096,521 | \$ - |
| 2034 | \$ 3,008,049 | \$ - |
| 2035 | \$ 2,919,577 | \$ - |
| 2036 | \$ 2,831,105 | \$ - |
| 2037 | \$ 2,742,633 | \$ - |
| 2038 | \$ 2,654,161 | \$ - |
| 2039 | \$ 2,565,689 | \$ - |
| 2040 | \$ 2,477,217 | \$ - |
| 2041 | \$ 2,388,745 | \$ - |
| 2042 | \$ 2,300,273 | \$ 2,300,273 |

Note:

Useful life of asset: 55.0 years

Source: BAE Urban Economics, Inc. 2012.

Table 11: NPV Calculation 115-03: Modernization with HPS

| Mid Year | One Time | | | | | | Recurring | | | Residual Value | | Net Present Value | | | | |
|---------------|------------------|---------------|----------------------|------------|------------|------------------|---------------------------|------------|---------------------|------------------|----------------|-------------------|------------------|------------|--------------|--------------|
| | New Construction | Modernization | Temporary Facilities | Relocation | Demo | Site Preparation | Environmental Remediation | Utilities | Repairs Maintenance | Other Operations | Building | Land | Undiscounted Sum | NPV Factor | Mid-Year | Cum NPV |
| 2012 | \$ - | \$ - | \$ - | \$ - | \$ 144,142 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 144,142 | 0.99 | \$ 142,722 | \$ 142,722 |
| 2013 | \$ - | \$ 3,481,412 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,244 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 3,530,678 | 0.97 | \$ 3,427,345 | \$ 3,570,067 |
| 2014 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,244 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,265 | 0.95 | \$ 46,886 | \$ 3,616,952 |
| 2015 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,244 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,265 | 0.93 | \$ 45,966 | \$ 3,662,919 |
| 2016 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,244 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,265 | 0.91 | \$ 45,065 | \$ 3,707,984 |
| 2017 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,244 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,265 | 0.90 | \$ 44,181 | \$ 3,752,165 |
| 2018 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,244 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,265 | 0.88 | \$ 43,315 | \$ 3,795,481 |
| 2019 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,244 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,265 | 0.86 | \$ 42,466 | \$ 3,837,947 |
| 2020 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,244 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,265 | 0.85 | \$ 41,633 | \$ 3,879,580 |
| 2021 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,244 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,265 | 0.83 | \$ 40,817 | \$ 3,920,397 |
| 2022 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,244 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,265 | 0.81 | \$ 40,017 | \$ 3,960,413 |
| 2023 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,244 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,265 | 0.80 | \$ 39,232 | \$ 3,999,645 |
| 2024 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,244 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,265 | 0.78 | \$ 38,463 | \$ 4,038,108 |
| 2025 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,244 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,265 | 0.77 | \$ 37,708 | \$ 4,075,816 |
| 2026 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,244 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,265 | 0.75 | \$ 36,969 | \$ 4,112,785 |
| 2027 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,244 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,265 | 0.74 | \$ 36,244 | \$ 4,149,030 |
| 2028 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,244 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,265 | 0.72 | \$ 35,534 | \$ 4,184,563 |
| 2029 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,244 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,265 | 0.71 | \$ 34,837 | \$ 4,219,400 |
| 2030 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,244 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,265 | 0.69 | \$ 34,154 | \$ 4,253,554 |
| 2031 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,244 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,265 | 0.68 | \$ 33,484 | \$ 4,287,038 |
| 2032 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,244 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,265 | 0.67 | \$ 32,828 | \$ 4,319,865 |
| 2033 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,244 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,265 | 0.65 | \$ 32,184 | \$ 4,352,049 |
| 2034 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,244 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,265 | 0.64 | \$ 31,553 | \$ 4,383,602 |
| 2035 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,244 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,265 | 0.63 | \$ 30,934 | \$ 4,414,536 |
| 2036 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,244 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,265 | 0.62 | \$ 30,328 | \$ 4,444,863 |
| 2037 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,244 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,265 | 0.60 | \$ 29,733 | \$ 4,474,596 |
| 2038 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,244 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,265 | 0.59 | \$ 29,150 | \$ 4,503,746 |
| 2039 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,244 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,265 | 0.58 | \$ 28,578 | \$ 4,532,324 |
| 2040 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,244 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,265 | 0.57 | \$ 28,018 | \$ 4,560,342 |
| 2041 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,244 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,265 | 0.56 | \$ 27,469 | \$ 4,587,811 |
| 2042 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,244 | \$ 12,037 | \$ 25,984 | \$ (1,645,759) | \$ - | \$ (1,596,493) | 0.55 | \$ (872,694) | \$ 3,715,117 |
| TOTALS | \$ - | \$ 3,481,412 | \$ - | \$ - | \$ 144,142 | \$ - | \$ - | \$ 337,335 | \$ 361,102 | \$ 779,523 | \$ (1,645,759) | \$ - | \$ 3,457,755 | | \$ 3,715,117 | \$ 3,715,117 |

Notes:

Alternative 1 Summary:

| | |
|--------------------|----------------|
| Capital Costs | \$ 3,625,554 |
| Recurring Costs | \$ 1,477,960 |
| Residual Value | \$ (1,645,759) |
| Non Discounted Sum | \$ 3,457,755 |
| Cum NPV | \$ 3,715,117 |

Key Assumptions:

| | | | |
|-----------------------------|------------------|---------------------------------|--|
| Discount Rate | 2.00% | Repairs and Maintenance | \$ 1.29 |
| Study Period | 25 years | Other Operations | \$ 2.78 |
| Base Year | 2012 | Cleaning per sq. ft. | \$ 1.12 |
| Report Output | Constant Dollars | Roads and Grounds | \$ 0.27 |
| Cost per sq. ft. | \$372 | Administrative | \$ 1.39 |
| Construction Period (years) | 1 | BOMA Expense CPI Adjustment | 2.16% |
| Building Size (sq. ft.) | 9,351 | Effective utilities per sq. ft. | \$ 1.20 Not from BOMA; calculated based on treatment specific energy usage |

Source: BAE Urban Economics, 2012.

Table 12: Schedule of Recurring Expenditures: 115-03 Modernization with HPS

| Year | Total Annual Expenditures | Electrical | | | Natural Gas | | | Water/Sewer (a) | | | | Other | |
|------|---------------------------|------------|---------|----------|-------------|-------|----------|-----------------|-------|---------|-------|-------|---------|
| | | Total Cost | kWh | \$/kWh | Total Cost | MMBtu | \$/MMBtu | Total Cost | Water | \$/Kgal | Waste | | \$/Kgal |
| 2012 | \$ 1,815 | \$ - | | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2013 | \$ 11,244 | \$ 9,429 | 157,157 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2014 | \$ 11,244 | \$ 9,429 | 157,157 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2015 | \$ 11,244 | \$ 9,429 | 157,157 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2016 | \$ 11,244 | \$ 9,429 | 157,157 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2017 | \$ 11,244 | \$ 9,429 | 157,157 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2018 | \$ 11,244 | \$ 9,429 | 157,157 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2019 | \$ 11,244 | \$ 9,429 | 157,157 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2020 | \$ 11,244 | \$ 9,429 | 157,157 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2021 | \$ 11,244 | \$ 9,429 | 157,157 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2022 | \$ 11,244 | \$ 9,429 | 157,157 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2023 | \$ 11,244 | \$ 9,429 | 157,157 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2024 | \$ 11,244 | \$ 9,429 | 157,157 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2025 | \$ 11,244 | \$ 9,429 | 157,157 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2026 | \$ 11,244 | \$ 9,429 | 157,157 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2027 | \$ 11,244 | \$ 9,429 | 157,157 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2028 | \$ 11,244 | \$ 9,429 | 157,157 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2029 | \$ 11,244 | \$ 9,429 | 157,157 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2030 | \$ 11,244 | \$ 9,429 | 157,157 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2031 | \$ 11,244 | \$ 9,429 | 157,157 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2032 | \$ 11,244 | \$ 9,429 | 157,157 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2033 | \$ 11,244 | \$ 9,429 | 157,157 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2034 | \$ 11,244 | \$ 9,429 | 157,157 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2035 | \$ 11,244 | \$ 9,429 | 157,157 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2036 | \$ 11,244 | \$ 9,429 | 157,157 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2037 | \$ 11,244 | \$ 9,429 | 157,157 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2038 | \$ 11,244 | \$ 9,429 | 157,157 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2039 | \$ 11,244 | \$ 9,429 | 157,157 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2040 | \$ 11,244 | \$ 9,429 | 157,157 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2041 | \$ 11,244 | \$ 9,429 | 157,157 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2042 | \$ 11,244 | \$ 9,429 | 157,157 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |

Notes:

- (a) Water and sewer combined and calculated on square foot basis based upon BOMA ERR data.
 - CPI adjustment factor: 2.16% bring 2011 BOMA ERR data to 2012 dollars.
 - Water/sewer utility expense \$0.19 per sq. ft.
 - Building total sq. ft. 9,351

Source: BAE Urban Economics, 2012.

**Table 13: Depreciation Schedule & Residual Value FTBL
115-03 Modernization with HPS**

| Period | Depreciation Schedule | Residual Value |
|---------------|----------------------------------|---------------------------|
| 2012 | \$ - | \$ - |
| 2013 | \$ 3,481,412 | \$ - |
| 2014 | \$ 3,418,114 | \$ - |
| 2015 | \$ 3,354,816 | \$ - |
| 2016 | \$ 3,291,517 | \$ - |
| 2017 | \$ 3,228,219 | \$ - |
| 2018 | \$ 3,164,920 | \$ - |
| 2019 | \$ 3,101,622 | \$ - |
| 2020 | \$ 3,038,324 | \$ - |
| 2021 | \$ 2,975,025 | \$ - |
| 2022 | \$ 2,911,727 | \$ - |
| 2023 | \$ 2,848,428 | \$ - |
| 2024 | \$ 2,785,130 | \$ - |
| 2025 | \$ 2,721,832 | \$ - |
| 2026 | \$ 2,658,533 | \$ - |
| 2027 | \$ 2,595,235 | \$ - |
| 2028 | \$ 2,531,936 | \$ - |
| 2029 | \$ 2,468,638 | \$ - |
| 2030 | \$ 2,405,340 | \$ - |
| 2031 | \$ 2,342,041 | \$ - |
| 2032 | \$ 2,278,743 | \$ - |
| 2033 | \$ 2,215,444 | \$ - |
| 2034 | \$ 2,152,146 | \$ - |
| 2035 | \$ 2,088,847 | \$ - |
| 2036 | \$ 2,025,549 | \$ - |
| 2037 | \$ 1,962,251 | \$ - |
| 2038 | \$ 1,898,952 | \$ - |
| 2039 | \$ 1,835,654 | \$ - |
| 2040 | \$ 1,772,355 | \$ - |
| 2041 | \$ 1,709,057 | \$ - |
| 2042 | \$ 1,645,759 | \$ 1,645,759 |

Note:

Useful life of asset: 55.0 years

Source: BAE Urban Economics, Inc. 2012.

Table 14: NPV Calculation 115-04: Modernization with AT/FP

| Mid Year | One Time | | | | | | | Recurring | | | Residual Value | | Net Present Value | | | |
|---------------|------------------|---------------|----------------------|------------|------------|------------------|---------------------------|------------|---------------------|------------------|----------------|------|-------------------|------------|--------------|--------------|
| | New Construction | Modernization | Temporary Facilities | Relocation | Demo | Site Preparation | Environmental Remediation | Utilities | Repairs Maintenance | Other Operations | Building | Land | Undiscounted Sum | NPV Factor | Mid-Year | Cum NPV |
| 2012 | \$ - | \$ - | \$ - | \$ - | \$ 192,178 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 192,178 | 0.99 | \$ 190,285 | \$ 190,285 |
| 2013 | \$ - | \$ 3,713,511 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,275 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 3,762,806 | 0.97 | \$ 3,652,680 | \$ 3,842,965 |
| 2014 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,275 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,296 | 0.95 | \$ 46,915 | \$ 3,889,880 |
| 2015 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,275 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,296 | 0.93 | \$ 45,995 | \$ 3,935,875 |
| 2016 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,275 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,296 | 0.91 | \$ 45,093 | \$ 3,980,968 |
| 2017 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,275 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,296 | 0.90 | \$ 44,209 | \$ 4,025,176 |
| 2018 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,275 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,296 | 0.88 | \$ 43,342 | \$ 4,068,518 |
| 2019 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,275 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,296 | 0.86 | \$ 42,492 | \$ 4,111,011 |
| 2020 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,275 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,296 | 0.85 | \$ 41,659 | \$ 4,152,669 |
| 2021 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,275 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,296 | 0.83 | \$ 40,842 | \$ 4,193,512 |
| 2022 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,275 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,296 | 0.81 | \$ 40,041 | \$ 4,233,553 |
| 2023 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,275 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,296 | 0.80 | \$ 39,256 | \$ 4,272,809 |
| 2024 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,275 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,296 | 0.78 | \$ 38,486 | \$ 4,311,296 |
| 2025 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,275 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,296 | 0.77 | \$ 37,732 | \$ 4,349,027 |
| 2026 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,275 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,296 | 0.75 | \$ 36,992 | \$ 4,386,019 |
| 2027 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,275 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,296 | 0.74 | \$ 36,267 | \$ 4,422,286 |
| 2028 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,275 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,296 | 0.72 | \$ 35,556 | \$ 4,457,841 |
| 2029 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,275 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,296 | 0.71 | \$ 34,858 | \$ 4,492,700 |
| 2030 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,275 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,296 | 0.69 | \$ 34,175 | \$ 4,526,875 |
| 2031 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,275 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,296 | 0.68 | \$ 33,505 | \$ 4,560,379 |
| 2032 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,275 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,296 | 0.67 | \$ 32,848 | \$ 4,593,227 |
| 2033 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,275 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,296 | 0.65 | \$ 32,204 | \$ 4,625,431 |
| 2034 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,275 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,296 | 0.64 | \$ 31,572 | \$ 4,657,003 |
| 2035 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,275 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,296 | 0.63 | \$ 30,953 | \$ 4,687,957 |
| 2036 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,275 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,296 | 0.62 | \$ 30,346 | \$ 4,718,303 |
| 2037 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,275 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,296 | 0.60 | \$ 29,751 | \$ 4,748,054 |
| 2038 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,275 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,296 | 0.59 | \$ 29,168 | \$ 4,777,222 |
| 2039 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,275 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,296 | 0.58 | \$ 28,596 | \$ 4,805,818 |
| 2040 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,275 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,296 | 0.57 | \$ 28,035 | \$ 4,833,853 |
| 2041 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,275 | \$ 12,037 | \$ 25,984 | \$ - | \$ - | \$ 49,296 | 0.56 | \$ 27,486 | \$ 4,861,339 |
| 2042 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 11,275 | \$ 12,037 | \$ 25,984 | \$ (1,755,478) | \$ - | \$ (1,706,182) | 0.55 | \$ (932,653) | \$ 3,928,686 |
| TOTALS | \$ - | \$ 3,713,511 | \$ - | \$ - | \$ 192,178 | \$ - | \$ - | \$ 338,249 | \$ 361,102 | \$ 779,523 | \$ (1,755,478) | \$ - | \$ 3,629,085 | | \$ 3,928,686 | \$ 3,928,686 |

Notes:

Alternative 1 Summary:

| | |
|--------------------|----------------|
| Capital Costs | \$ 3,905,689 |
| Recurring Costs | \$ 1,478,874 |
| Residual Value | \$ (1,755,478) |
| Non Discounted Sum | \$ 3,629,085 |
| Cum NPV | \$ 3,928,686 |

Key Assumptions:

| | | | |
|-----------------------------|------------------|---------------------------------|--|
| Discount Rate | 2.00% | Repairs and Maintenance | \$ 1.29 |
| Study Period | 25 years | Other Operations | \$ 2.78 |
| Base Year | 2012 | Cleaning per sq. ft. | \$ 1.12 |
| Report Output | Constant Dollars | Roads and Grounds | \$ 0.27 |
| Cost per sq. ft. | \$397 | Administrative | \$ 1.39 |
| Construction Period (years) | 1 | BOMA Expense CPI Adjustment | 2.16% |
| Building Size (sq. ft.) | 9,351 | Effective utilities per sq. ft. | \$ 1.21 Not from BOMA; calculated based on treatment specific energy usage |

Source: BAE Urban Economics, 2012.

Table 15: Schedule of Recurring Expenditures: 115-04 Modernization with AT/FP

| Year | Total Annual Expenditures | Electrical | | | Natural Gas | | | Water/Sewer (a) | | | | | |
|------|---------------------------|------------|---------|----------|-------------|-------|----------|-----------------|-------|---------|-------|---------|-------|
| | | Total Cost | kWh | \$/kWh | Total Cost | MMBtu | \$/MMBtu | Total Cost | Water | \$/Kgal | Waste | \$/Kgal | Other |
| 2012 | \$ 1,815 | \$ - | | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2013 | \$ 11,275 | \$ 9,460 | 157,665 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2014 | \$ 11,275 | \$ 9,460 | 157,665 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2015 | \$ 11,275 | \$ 9,460 | 157,665 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2016 | \$ 11,275 | \$ 9,460 | 157,665 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2017 | \$ 11,275 | \$ 9,460 | 157,665 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2018 | \$ 11,275 | \$ 9,460 | 157,665 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2019 | \$ 11,275 | \$ 9,460 | 157,665 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2020 | \$ 11,275 | \$ 9,460 | 157,665 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2021 | \$ 11,275 | \$ 9,460 | 157,665 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2022 | \$ 11,275 | \$ 9,460 | 157,665 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2023 | \$ 11,275 | \$ 9,460 | 157,665 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2024 | \$ 11,275 | \$ 9,460 | 157,665 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2025 | \$ 11,275 | \$ 9,460 | 157,665 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2026 | \$ 11,275 | \$ 9,460 | 157,665 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2027 | \$ 11,275 | \$ 9,460 | 157,665 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2028 | \$ 11,275 | \$ 9,460 | 157,665 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2029 | \$ 11,275 | \$ 9,460 | 157,665 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2030 | \$ 11,275 | \$ 9,460 | 157,665 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2031 | \$ 11,275 | \$ 9,460 | 157,665 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2032 | \$ 11,275 | \$ 9,460 | 157,665 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2033 | \$ 11,275 | \$ 9,460 | 157,665 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2034 | \$ 11,275 | \$ 9,460 | 157,665 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2035 | \$ 11,275 | \$ 9,460 | 157,665 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2036 | \$ 11,275 | \$ 9,460 | 157,665 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2037 | \$ 11,275 | \$ 9,460 | 157,665 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2038 | \$ 11,275 | \$ 9,460 | 157,665 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2039 | \$ 11,275 | \$ 9,460 | 157,665 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2040 | \$ 11,275 | \$ 9,460 | 157,665 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2041 | \$ 11,275 | \$ 9,460 | 157,665 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |
| 2042 | \$ 11,275 | \$ 9,460 | 157,665 | \$ 0.060 | \$ - | | \$ 5.39 | \$ 1,815 | | | | | \$ - |

Notes:

- (a) Water and sewer combined and calculated on square foot basis based upon BOMA ERR data.
 - CPI adjustment factor: 2.16% bring 2011 BOMA ERR data to 2012 dollars.
 - Water/sewer utility expense \$0.19 per sq. ft.
 - Building total sq. ft. 9,351

Source: BAE Urban Economics, 2012.

**Table 16: Depreciation Schedule & Residual Value FTBL
115-04 Modernization with AT/FP**

| Period | Depreciation Schedule | Residual Value |
|---------------|----------------------------------|---------------------------|
| 2012 | \$ - | \$ - |
| 2013 | \$ 3,713,511 | \$ - |
| 2014 | \$ 3,645,992 | \$ - |
| 2015 | \$ 3,578,474 | \$ - |
| 2016 | \$ 3,510,956 | \$ - |
| 2017 | \$ 3,443,437 | \$ - |
| 2018 | \$ 3,375,919 | \$ - |
| 2019 | \$ 3,308,400 | \$ - |
| 2020 | \$ 3,240,882 | \$ - |
| 2021 | \$ 3,173,364 | \$ - |
| 2022 | \$ 3,105,845 | \$ - |
| 2023 | \$ 3,038,327 | \$ - |
| 2024 | \$ 2,970,809 | \$ - |
| 2025 | \$ 2,903,290 | \$ - |
| 2026 | \$ 2,835,772 | \$ - |
| 2027 | \$ 2,768,253 | \$ - |
| 2028 | \$ 2,700,735 | \$ - |
| 2029 | \$ 2,633,217 | \$ - |
| 2030 | \$ 2,565,698 | \$ - |
| 2031 | \$ 2,498,180 | \$ - |
| 2032 | \$ 2,430,662 | \$ - |
| 2033 | \$ 2,363,143 | \$ - |
| 2034 | \$ 2,295,625 | \$ - |
| 2035 | \$ 2,228,106 | \$ - |
| 2036 | \$ 2,160,588 | \$ - |
| 2037 | \$ 2,093,070 | \$ - |
| 2038 | \$ 2,025,551 | \$ - |
| 2039 | \$ 1,958,033 | \$ - |
| 2040 | \$ 1,890,515 | \$ - |
| 2041 | \$ 1,822,996 | \$ - |
| 2042 | \$ 1,755,478 | \$ 1,755,478 |

Note:

Useful life of asset: 55.0 years

Source: BAE Urban Economics, Inc. 2012.

Table 17: South U.S. Urban Consumer Price Index

| Year | Index (1982=100) | Annual CPI % Change |
|-------------|-----------------------------|--------------------------------|
| 1993 | 140.80 | 3.15% |
| 1994 | 144.70 | 2.77% |
| 1995 | 149.00 | 2.97% |
| 1996 | 153.60 | 3.09% |
| 1997 | 156.90 | 2.15% |
| 1998 | 158.90 | 1.27% |
| 1999 | 162.00 | 1.95% |
| 2000 | 167.20 | 3.21% |
| 2001 | 171.10 | 2.33% |
| 2002 | 173.30 | 1.29% |
| 2003 | 177.30 | 2.31% |
| 2004 | 181.80 | 2.54% |
| 2005 | 188.30 | 3.58% |
| 2006 | 194.70 | 3.40% |
| 2007 | 200.36 | 2.91% |
| 2008 | 208.68 | 4.15% |
| 2009 | 207.85 | -0.40% |
| 2010 | 211.34 | 1.68% |
| 2011 | 218.62 | 3.44% |
| 2012 | 223.34 | 2.16% |

Annual Average**20-years: 2.5%****LCCA Assumption: 0.0%**

Source: U.S. Department of Labor, Bureau of Labor
Statistics; BAE Urban Economics, Inc. 2012.

Table 18: Discount Rates and Factors

| Year | Discount Factors | | Beginning of Year | Calander Year |
|------|------------------|----------|----------------------|------------------|
| | End of Year | Mid-Year | | |
| 1 | 0.9804 | 0.9901 | 1.0000 | 2012 |
| 2 | 0.9612 | 0.9707 | 0.9804 | 2013 |
| 3 | 0.9423 | 0.9517 | 0.9612 | 2014 |
| 4 | 0.9238 | 0.9330 | 0.9423 | 2015 |
| 5 | 0.9057 | 0.9147 | 0.9238 | 2016 |
| 6 | 0.8880 | 0.8968 | 0.9057 | 2017 |
| 7 | 0.8706 | 0.8792 | 0.8880 | 2018 |
| 8 | 0.8535 | 0.8620 | 0.8706 | 2019 |
| 9 | 0.8368 | 0.8451 | 0.8535 | 2020 |
| 10 | 0.8203 | 0.8285 | 0.8368 | 2021 |
| 11 | 0.8043 | 0.8123 | 0.8203 | 2022 |
| 12 | 0.7885 | 0.7963 | 0.8043 | 2023 |
| 13 | 0.7730 | 0.7807 | 0.7885 | 2024 |
| 14 | 0.7579 | 0.7654 | 0.7730 | 2025 |
| 15 | 0.7430 | 0.7504 | 0.7579 | 2026 |
| 16 | 0.7284 | 0.7357 | 0.7430 | 2027 |
| 17 | 0.7142 | 0.7213 | 0.7284 | 2028 |
| 18 | 0.7002 | 0.7071 | 0.7142 | 2029 |
| 19 | 0.6864 | 0.6933 | 0.7002 | 2030 |
| 20 | 0.6730 | 0.6797 | 0.6864 | 2031 |
| 21 | 0.6598 | 0.6663 | 0.6730 | 2032 |
| 22 | 0.6468 | 0.6533 | 0.6598 | 2033 |
| 23 | 0.6342 | 0.6405 | 0.6468 | 2034 |
| 24 | 0.6217 | 0.6279 | 0.6342 | 2035 |
| 25 | 0.6095 | 0.6156 | 0.6217 | 2036 |
| 26 | 0.5976 | 0.6035 | 0.6095 | 2037 |
| 27 | 0.5859 | 0.5917 | 0.5976 | 2038 |
| 28 | 0.5744 | 0.5801 | 0.5859 | 2039 |
| 29 | 0.5631 | 0.5687 | 0.5744 | 2040 |
| 30 | 0.5521 | 0.5576 | 0.5631 | 2041 |
| 31 | 0.5412 | 0.5466 | 0.5521 | 2042 |

Notes:

30-Year real discount rate 2.0%

Mid-year factor: 1.0100

Sources: Office of Management and Budget, OMB Circular A-94,
Appendix C; BAE Urban Economics, 2012.

Life Cycle Cost Analysis (LCCA) Spreadsheet

St. Juliens Creek Annex, Chesapeake VA

**ESTCP SI 0931
LCCA Demonstration**

Historic Building 61

Mission: General Administrative Office

Prepared by:
BAE Urban Economics, Inc.

December 2012

Table III-23: Life Cycle Cost Analysis Summary: SJCA 061

| Alternative | Non Discounted Costs by Component | | | Total Costs | | |
|--|-----------------------------------|--------------|----------------|----------------|----------------------------|---------------------------|
| | Initial Investment | Recurring | Residual Value | Non Discounted | Discounted - No GHG Factor | Discounted - w/GHG Factor |
| SJCA 061-01: Status Quo - Sustainment | \$ 2,242,713 | \$ 1,953,301 | \$ - | \$ 4,196,014 | \$ 3,620,942 | \$ 3,720,197 |
| SJCA 061-02: Demolition and New Construction | \$ 4,570,115 | \$ 1,645,186 | \$ (2,004,815) | \$ 4,210,485 | \$ 4,562,966 | \$ 4,653,509 |
| SJCA 061-03: Modernization with HPS | \$ 3,812,517 | \$ 1,645,186 | \$ (1,793,037) | \$ 3,664,666 | \$ 3,937,295 | \$ 4,011,507 |
| SJCA 061-04: Modernization with AT/FP | \$ 4,260,220 | \$ 1,645,186 | \$ (2,003,646) | \$ 3,901,760 | \$ 4,256,812 | \$ 4,337,150 |

Notes:

| | |
|---|----------|
| Study Period (years): | 30 |
| Real Discount Rate: | 2.00% |
| Average CO ₂ e Value/MT (undiscounted) | \$ 37.25 |
| Base Date: | 10/01/12 |

Source: BAE Urban Economics, 2012.

Table III-24: Greenhouse Gas Valuation Summary: SJCA 061

| Alternative | GHG Emissions by Scope (MT CO ₂ e) | | | | GHG Value | |
|--|---|----------|---------|----------|----------------|------------|
| | Scope 1 | Scope 2 | Scope 3 | Total | Non Discounted | Discounted |
| SJCA 061-01: Status Quo - Sustainment | - | 3,755.18 | 67.42 | 3,822.60 | \$ 142,795 | \$ 99,255 |
| SJCA 061-02: Demolition and New Construction | - | 2,138.00 | 940.68 | 3,078.68 | \$ 114,612 | \$ 90,543 |
| SJCA 061-03: Modernization with HPS | - | 2,127.96 | 529.69 | 2,657.65 | \$ 99,064 | \$ 74,212 |
| SJCA 061-04: Modernization with AT/FP | - | 2,138.00 | 660.05 | 2,798.05 | \$ 104,252 | \$ 80,338 |

Notes:

| | |
|---|----------|
| Study Period (years): | 30 |
| Real Discount Rate: | 2.00% |
| Average CO ₂ e Value/MT (undiscounted) | \$ 37.25 |
| Base Date: | 10/01/12 |

Sources: Center for Resource Solutions; BAE Urban Economics, 2012.

Table 3: Alternatives Summary: SJCA 061

| Project Alternative | Building GSF | | Building Features | | Construction Cost | |
|--|---------------------|------------------|--------------------------|--------------|--------------------------|---------------|
| | Total | Footprint | LEED | AT/FP | Total | Per SF |
| SJCA 061-01: Sustainment - Status Quo | 10,251 | 10,251 | n/a | No | \$ 2,242,713 | \$ 219 |
| SJCA 061-02: Demolition & New Construction | 10,251 | 10,251 | 53 | Yes | \$ 4,570,115 | \$ 446 |
| SJCA 061-03: Modernization with HPS | 10,251 | 10,251 | 59 | Yes | \$ 3,812,517 | \$ 372 |
| SJCA 061-04: Modernization with AT/FP | 10,251 | 10,251 | 59 | Yes+ | \$ 4,260,220 | \$ 416 |

+ Current prescriptive practices and treatments.

Sources: Preservation Associates; Center for Resource Solutions; BAE Urban Economics, 2012.

Table 4: Construction Cost Summary: SJCA 061

| Category | Cost Estimate | | | |
|--------------------------------|-----------------------------------|---|----------------------------------|------------------------------------|
| | 01. Sustainment- Status Quo | 02. Demolition and New Construction | 03. Modernization with HPS | 04. Modernization with AT/FP |
| Demolition | \$ - | \$ 329,160 | \$ 19,555 | \$ 21,738 |
| Substructure | \$ 1,239,602 | \$ 344,080 | \$ 122,560 | \$ 186,560 |
| Shell | \$ 56,842 | \$ 935,110 | \$ 745,847 | \$ 1,011,890 |
| Interiors | \$ 64,309 | \$ 267,828 | \$ 325,465 | \$ 324,813 |
| Services | \$ 385,160 | \$ 1,008,470 | \$ 1,112,653 | \$ 1,093,885 |
| Sitework | \$ - | \$ 326,362 | \$ 347,314 | \$ 348,942 |
| Special Construction | \$ - | \$ 10,800 | \$ 10,800 | \$ 10,800 |
| Hard cost subtotal | \$ 1,745,913 | \$ 3,221,809 | \$ 2,684,194 | \$ 2,998,628 |
| General conditions (25%) | \$ 261,887 | \$ 818,284 | \$ 682,635 | \$ 762,797 |
| Security escalation (2%) | \$ - | \$ 51,326 | \$ 46,346 | \$ 52,559 |
| USACE design (6%) | \$ 120,468 | \$ 245,485 | \$ 204,791 | \$ 228,839 |
| USACE SOIH (5.7%) | \$ 114,445 | \$ 233,211 | \$ 194,551 | \$ 217,397 |
| Soft cost subtotal | \$ 496,800 | \$ 1,348,305 | \$ 1,128,323 | \$ 1,261,592 |
| Construction cost total | \$ 2,242,713 | \$ 4,570,115 | \$ 3,812,517 | \$ 4,260,220 |
| Construction cost PSF | \$219 | \$ 446 | \$ 372 | \$ 416 |
| % Difference from 02 | -51% | N/A | -17% | -7% |

Sources: Preservation Associates; Center for Resource Solutions; BAE Urban Economics, 2012.

Table 5: NPV Calculations 061-01 Sustainment-Status Quo

| Mid Year | One Time | | | | | | | Recurring | | | Residual Value | | Net Present Value | | | |
|---------------|------------------|--------------|----------------------|------------|------|------------------|---------------------------|------------|---------------------|------------------|----------------|------|-------------------|------------|--------------|--------------|
| | New Construction | Major Repair | Temporary Facilities | Relocation | Demo | Site Preparation | Environmental Remediation | Utilities | Repairs Maintenance | Other Operations | Building | Land | Undiscounted Sum | NPV Factor | Mid-Year | Cum NPV |
| 2012 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | 0.99 | \$ - | \$ - |
| 2013 | \$ - | \$ 2,242,713 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 25,420 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 2,307,823 | 0.97 | \$ 2,240,280 | \$ 2,240,280 |
| 2014 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 25,420 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,110 | 0.95 | \$ 61,965 | \$ 2,302,245 |
| 2015 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 25,420 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,110 | 0.93 | \$ 60,750 | \$ 2,362,995 |
| 2016 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 25,420 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,110 | 0.91 | \$ 59,559 | \$ 2,422,554 |
| 2017 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 25,420 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,110 | 0.90 | \$ 58,391 | \$ 2,480,945 |
| 2018 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 25,420 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,110 | 0.88 | \$ 57,246 | \$ 2,538,191 |
| 2019 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 25,420 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,110 | 0.86 | \$ 56,124 | \$ 2,594,315 |
| 2020 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 25,420 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,110 | 0.85 | \$ 55,023 | \$ 2,649,338 |
| 2021 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 25,420 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,110 | 0.83 | \$ 53,944 | \$ 2,703,283 |
| 2022 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 25,420 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,110 | 0.81 | \$ 52,887 | \$ 2,756,169 |
| 2023 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 25,420 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,110 | 0.80 | \$ 51,850 | \$ 2,808,019 |
| 2024 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 25,420 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,110 | 0.78 | \$ 50,833 | \$ 2,858,852 |
| 2025 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 25,420 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,110 | 0.77 | \$ 49,836 | \$ 2,908,688 |
| 2026 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 25,420 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,110 | 0.75 | \$ 48,859 | \$ 2,957,547 |
| 2027 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 25,420 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,110 | 0.74 | \$ 47,901 | \$ 3,005,449 |
| 2028 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 25,420 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,110 | 0.72 | \$ 46,962 | \$ 3,052,410 |
| 2029 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 25,420 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,110 | 0.71 | \$ 46,041 | \$ 3,098,451 |
| 2030 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 25,420 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,110 | 0.69 | \$ 45,138 | \$ 3,143,590 |
| 2031 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 25,420 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,110 | 0.68 | \$ 44,253 | \$ 3,187,843 |
| 2032 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 25,420 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,110 | 0.67 | \$ 43,385 | \$ 3,231,228 |
| 2033 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 25,420 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,110 | 0.65 | \$ 42,535 | \$ 3,273,763 |
| 2034 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 25,420 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,110 | 0.64 | \$ 41,701 | \$ 3,315,464 |
| 2035 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 25,420 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,110 | 0.63 | \$ 40,883 | \$ 3,356,347 |
| 2036 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 25,420 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,110 | 0.62 | \$ 40,081 | \$ 3,396,428 |
| 2037 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 25,420 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,110 | 0.60 | \$ 39,296 | \$ 3,435,724 |
| 2038 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 25,420 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,110 | 0.59 | \$ 38,525 | \$ 3,474,249 |
| 2039 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 25,420 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,110 | 0.58 | \$ 37,770 | \$ 3,512,019 |
| 2040 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 25,420 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,110 | 0.57 | \$ 37,029 | \$ 3,549,048 |
| 2041 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 25,420 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,110 | 0.56 | \$ 36,303 | \$ 3,585,351 |
| 2042 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 25,420 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,110 | 0.55 | \$ 35,591 | \$ 3,620,942 |
| TOTALS | \$ - | \$ 2,242,713 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 762,587 | \$ 417,849 | \$ 772,864 | \$ - | \$ - | \$ 4,196,014 | | \$ 3,620,942 | \$ 3,620,942 |

NOTES:

Project Alternative Summary

| | |
|--------------------|--------------|
| Capital Costs | \$ 2,242,713 |
| Recurring Costs | \$ 1,953,301 |
| Residual Value | \$ - |
| Non Discounted Sum | \$ 4,196,014 |
| Cum NPV | \$ 3,620,942 |

Key Assumptions:

| | | | |
|-----------------------------|------------------|---------------------------------|---|
| Discount Rate | 2.00% | Repairs and Maintenance | \$ 1.36 |
| Study Period | 30 years | Other Operations | \$ 2.51 |
| BaseYear | 2012 | Cleaning per sq. ft. | \$ 0.74 |
| Report Output | Constant Dollars | Roads and Grounds | \$ 0.51 |
| Cost per sq. ft. | \$219 | Administrative | \$ 1.27 |
| Construction Period (years) | 1 | BOMA Expense CPI Adjustment | 2.16% |
| Building Size (sq. ft.) | 10,251 | Effective utilities per sq. ft. | \$ 2.48 Not from BOMA; calculated based on treatment specific energy usage. |

SOURCE: BAE Urban Economics, 2012.

Table 6: Schedule of Recurring Expenditures SJCA 061-01 Sustainment-Status Quo

| Year | Total Annual Expenditures | Electrical | | | Natural Gas | | | Water/Sewer (a) | | | | Other | |
|------|---------------------------|------------|---------|----------|-------------|-------|----------|-----------------|--------------|---------|-------|-------|---------|
| | | Total Cost | kWh | \$/kWh | Total Cost | MMBtu | \$/MMBtu | Total Cost | Water (Kgal) | \$/Kgal | Waste | | \$/Kgal |
| 2012 | \$ 25,420 | \$ 23,849 | 290,838 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2013 | \$ 25,420 | \$ 23,849 | 290,838 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2014 | \$ 25,420 | \$ 23,849 | 290,838 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2015 | \$ 25,420 | \$ 23,849 | 290,838 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2016 | \$ 25,420 | \$ 23,849 | 290,838 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2017 | \$ 25,420 | \$ 23,849 | 290,838 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2018 | \$ 25,420 | \$ 23,849 | 290,838 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2019 | \$ 25,420 | \$ 23,849 | 290,838 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2020 | \$ 25,420 | \$ 23,849 | 290,838 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2021 | \$ 25,420 | \$ 23,849 | 290,838 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2022 | \$ 25,420 | \$ 23,849 | 290,838 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2023 | \$ 25,420 | \$ 23,849 | 290,838 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2024 | \$ 25,420 | \$ 23,849 | 290,838 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2025 | \$ 25,420 | \$ 23,849 | 290,838 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2026 | \$ 25,420 | \$ 23,849 | 290,838 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2027 | \$ 25,420 | \$ 23,849 | 290,838 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2028 | \$ 25,420 | \$ 23,849 | 290,838 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2029 | \$ 25,420 | \$ 23,849 | 290,838 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2030 | \$ 25,420 | \$ 23,849 | 290,838 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2031 | \$ 25,420 | \$ 23,849 | 290,838 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2032 | \$ 25,420 | \$ 23,849 | 290,838 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2033 | \$ 25,420 | \$ 23,849 | 290,838 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2034 | \$ 25,420 | \$ 23,849 | 290,838 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2035 | \$ 25,420 | \$ 23,849 | 290,838 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2036 | \$ 25,420 | \$ 23,849 | 290,838 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2037 | \$ 25,420 | \$ 23,849 | 290,838 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2038 | \$ 25,420 | \$ 23,849 | 290,838 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2039 | \$ 25,420 | \$ 23,849 | 290,838 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2040 | \$ 25,420 | \$ 23,849 | 290,838 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2041 | \$ 25,420 | \$ 23,849 | 290,838 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2042 | \$ 25,420 | \$ 23,849 | 290,838 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |

Notes:

- (a) Water and sewer combined and calculated on square foot basis based upon BOMA ERR data.
 - CPI adjustment factor: 2.16% bring 2011 BOMA ERR data to 2012 dollars.
 - Water/sewer utility expense \$0.15 per sq. ft.
 - Building total sq. ft. 10,251

Source: BAE Urban Economics, 2012.

**Table 7: Depreciation Schedule & Residual Value SJCA
061-01: Sustainment-Status Quo**

| Period | Depreciation Schedule | Residual Value |
|---------------|----------------------------------|---------------------------|
| 2012 | \$ - | \$ - |
| 2013 | \$ 2,242,713 | \$ - |
| 2014 | \$ 2,130,577 | \$ - |
| 2015 | \$ 2,018,442 | \$ - |
| 2016 | \$ 1,906,306 | \$ - |
| 2017 | \$ 1,794,170 | \$ - |
| 2018 | \$ 1,682,035 | \$ - |
| 2019 | \$ 1,569,899 | \$ - |
| 2020 | \$ 1,457,764 | \$ - |
| 2021 | \$ 1,345,628 | \$ - |
| 2022 | \$ 1,233,492 | \$ - |
| 2023 | \$ 1,121,357 | \$ - |
| 2024 | \$ 1,009,221 | \$ - |
| 2025 | \$ 897,085 | \$ - |
| 2026 | \$ 784,950 | \$ - |
| 2027 | \$ 672,814 | \$ - |
| 2028 | \$ 560,678 | \$ - |
| 2029 | \$ 448,543 | \$ - |
| 2030 | \$ 336,407 | \$ - |
| 2031 | \$ 224,271 | \$ - |
| 2032 | \$ 112,136 | \$ - |
| 2033 | \$ 0 | \$ - |
| 2034 | \$ - | \$ - |
| 2035 | \$ - | \$ - |
| 2036 | \$ - | \$ - |
| 2037 | \$ - | \$ - |
| 2038 | \$ - | \$ - |
| 2039 | \$ - | \$ - |
| 2040 | \$ - | \$ - |
| 2041 | \$ - | \$ - |
| 2042 | \$ - | \$ - |

NOTE:

Useful life of asset: 20.0 years

Source: BAE Urban Economics, Inc. 2012.

Table 8: NPV Calculation 061-02: Demolition and New Construction

| Mid Year | One Time | | | | | | | Recurring | | | Residual Value | | Net Present Value | | | |
|---------------|------------------|--------------|----------------------|------------|------------|------------------|---------------------------|------------|------------|------------------|----------------|------|-------------------|------------|----------------|--------------|
| | New Construction | Major Repair | Temporary Facilities | Relocation | Demo | Site Preparation | Environmental Remediation | Utilities | Repairs | Other Operations | Building | Land | Undiscounted Sum | NPV Factor | Mid-Year | Cum NPV |
| 2012 | \$ - | \$ - | \$ - | \$ - | \$ 329,160 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 329,160 | 0.99 | \$ 325,917 | \$ 325,917 |
| 2013 | \$ - | \$ 4,240,955 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 4,295,795 | 0.97 | \$ 4,170,069 | \$ 4,495,986 |
| 2014 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.95 | \$ 52,191 | \$ 4,548,176 |
| 2015 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.93 | \$ 51,167 | \$ 4,599,344 |
| 2016 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.91 | \$ 50,164 | \$ 4,649,508 |
| 2017 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.90 | \$ 49,180 | \$ 4,698,688 |
| 2018 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.88 | \$ 48,216 | \$ 4,746,904 |
| 2019 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.86 | \$ 47,271 | \$ 4,794,175 |
| 2020 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.85 | \$ 46,344 | \$ 4,840,519 |
| 2021 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.83 | \$ 45,435 | \$ 4,885,954 |
| 2022 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.81 | \$ 44,544 | \$ 4,930,498 |
| 2023 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.80 | \$ 43,671 | \$ 4,974,169 |
| 2024 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.78 | \$ 42,815 | \$ 5,016,984 |
| 2025 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.77 | \$ 41,975 | \$ 5,058,959 |
| 2026 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.75 | \$ 41,152 | \$ 5,100,111 |
| 2027 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.74 | \$ 40,345 | \$ 5,140,456 |
| 2028 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.72 | \$ 39,554 | \$ 5,180,010 |
| 2029 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.71 | \$ 38,778 | \$ 5,218,789 |
| 2030 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.69 | \$ 38,018 | \$ 5,256,807 |
| 2031 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.68 | \$ 37,273 | \$ 5,294,079 |
| 2032 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.67 | \$ 36,542 | \$ 5,330,621 |
| 2033 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.65 | \$ 35,825 | \$ 5,366,447 |
| 2034 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.64 | \$ 35,123 | \$ 5,401,569 |
| 2035 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.63 | \$ 34,434 | \$ 5,436,004 |
| 2036 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.62 | \$ 33,759 | \$ 5,469,763 |
| 2037 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.60 | \$ 33,097 | \$ 5,502,860 |
| 2038 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.59 | \$ 32,448 | \$ 5,535,308 |
| 2039 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.58 | \$ 31,812 | \$ 5,567,120 |
| 2040 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.57 | \$ 31,188 | \$ 5,598,308 |
| 2041 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.56 | \$ 30,577 | \$ 5,628,884 |
| 2042 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ (2,004,815) | \$ - | \$ (1,949,976) | 0.55 | \$ (1,065,918) | \$ 4,562,966 |
| TOTALS | \$ - | \$ 4,240,955 | \$ - | \$ - | \$ 329,160 | \$ - | \$ - | \$ 454,472 | \$ 417,849 | \$ 772,864 | \$ (2,004,815) | \$ - | \$ 4,210,485 | | \$ 4,562,966 | \$ 4,562,966 |

NOTES:

Alternative 1 Summary:

| | |
|--------------------|----------------|
| Capital Costs | \$ 4,570,115 |
| Recurring Costs | \$ 1,645,186 |
| Residual Value | \$ (2,004,815) |
| Non Discounted Sum | \$ 4,210,485 |
| Cum NPV | \$ 4,562,966 |

Key Assumptions:

| | | | |
|-----------------------------|------------------|---------------------------------|---------|
| Discount Rate | 2.00% | Repairs and Maintenance | \$ 1.36 |
| Study Period | 30 years | Other Operations | \$ 2.51 |
| BaseYear | 2012 | Cleaning per sq. ft. | \$ 0.74 |
| Report Output | Constant Dollars | Roads and Grounds | \$ 0.51 |
| Cost per sq. ft. | \$414 | Administrative | \$ 1.27 |
| Construction Period (years) | 1 | BOMA Expense CPI Adjustment | 2.16% |
| Building Size (sq. ft.) | 10,251 | Effective utilities per sq. ft. | \$ 1.48 |

Not from BOMA; calculated based on treatment specific energy usage.

Source: BAE Urban Economics, Inc. 2012.

Table 9: Schedule of Recurring Expenditures: SJCA 061-02 Demolition and New Construction

| Year | Total Annual Expenditures | Electrical | | | Natural Gas | | | Water/Sewer (a) | | | | Other | |
|------|---------------------------|------------|---------|----------|-------------|-------|----------|-----------------|-------|---------|-------|-------|---------|
| | | Total Cost | kWh | \$/kWh | Total Cost | MMBtu | \$/MMBtu | Total Cost | Water | \$/Kgal | Waste | | \$/Kgal |
| 2012 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2013 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2014 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2015 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2016 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2017 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2018 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2019 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2020 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2021 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2022 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2023 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2024 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2025 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2026 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2027 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2028 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2029 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2030 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2031 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2032 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2033 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2034 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2035 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2036 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2037 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2038 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2039 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2040 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2041 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2042 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |

Notes:

- (a) Water and sewer combined and calculated on square foot basis based upon BOMA ERR data.
 - CPI adjustment factor: 2.16% bring 2011 BOMA ERR data to 2012 dollars.
 - Water/sewer utility expense \$0.15 per sq. ft.
 - Building total sq. ft. 10,251

SOURCE: BAE Urban Economics, 2012.

**Table 10: Depreciation Schedule & Residual Value:
SJCA 061-02 Demolition and New Construction**

| Period | Depreciation Schedule | Residual Value |
|---------------|----------------------------------|---------------------------|
| 2012 | \$ - | \$ - |
| 2013 | \$ 4,240,955 | \$ - |
| 2014 | \$ 4,163,847 | \$ - |
| 2015 | \$ 4,086,738 | \$ - |
| 2016 | \$ 4,009,630 | \$ - |
| 2017 | \$ 3,932,522 | \$ - |
| 2018 | \$ 3,855,414 | \$ - |
| 2019 | \$ 3,778,305 | \$ - |
| 2020 | \$ 3,701,197 | \$ - |
| 2021 | \$ 3,624,089 | \$ - |
| 2022 | \$ 3,546,981 | \$ - |
| 2023 | \$ 3,469,872 | \$ - |
| 2024 | \$ 3,392,764 | \$ - |
| 2025 | \$ 3,315,656 | \$ - |
| 2026 | \$ 3,238,547 | \$ - |
| 2027 | \$ 3,161,439 | \$ - |
| 2028 | \$ 3,084,331 | \$ - |
| 2029 | \$ 3,007,223 | \$ - |
| 2030 | \$ 2,930,114 | \$ - |
| 2031 | \$ 2,853,006 | \$ - |
| 2032 | \$ 2,775,898 | \$ - |
| 2033 | \$ 2,698,790 | \$ - |
| 2034 | \$ 2,621,681 | \$ - |
| 2035 | \$ 2,544,573 | \$ - |
| 2036 | \$ 2,467,465 | \$ - |
| 2037 | \$ 2,390,356 | \$ - |
| 2038 | \$ 2,313,248 | \$ - |
| 2039 | \$ 2,236,140 | \$ - |
| 2040 | \$ 2,159,032 | \$ - |
| 2041 | \$ 2,081,923 | \$ - |
| 2042 | \$ 2,004,815 | \$ 2,004,815 |

NOTE:

Useful life of asset: 55.0 years

SOURCE: BAE Urban Economics, Inc.

Table 11: NPV Calculation 061-03: Modernization with HPS

| Mid Year | One Time | | | | | | Recurring | | | Residual Value | | Net Present Value | | | | |
|---------------|------------------|---------------|----------------------|------------|-----------|------------------|---------------------------|------------|------------|------------------|----------------|-------------------|------------------|------------|--------------|--------------|
| | New Construction | Modernization | Temporary Facilities | Relocation | Demo | Site Preparation | Environmental Remediation | Utilities | Repairs | Other Operations | Building | Land | Undiscounted Sum | NPV Factor | Mid-Year | Cum NPV |
| 2012 | \$ - | \$ - | \$ - | \$ - | \$ 19,555 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 19,555 | 0.99 | \$ 19,362 | \$ 19,362 |
| 2013 | \$ - | \$ 3,792,962 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 3,847,802 | 0.97 | \$ 3,735,187 | \$ 3,754,550 |
| 2014 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.95 | \$ 52,191 | \$ 3,806,741 |
| 2015 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.93 | \$ 51,167 | \$ 3,857,908 |
| 2016 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.91 | \$ 50,164 | \$ 3,908,072 |
| 2017 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.90 | \$ 49,180 | \$ 3,957,252 |
| 2018 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.88 | \$ 48,216 | \$ 4,005,469 |
| 2019 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.86 | \$ 47,271 | \$ 4,052,739 |
| 2020 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.85 | \$ 46,344 | \$ 4,099,083 |
| 2021 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.83 | \$ 45,435 | \$ 4,144,518 |
| 2022 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.81 | \$ 44,544 | \$ 4,189,063 |
| 2023 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.80 | \$ 43,671 | \$ 4,232,734 |
| 2024 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.78 | \$ 42,815 | \$ 4,275,548 |
| 2025 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.77 | \$ 41,975 | \$ 4,317,523 |
| 2026 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.75 | \$ 41,152 | \$ 4,358,675 |
| 2027 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.74 | \$ 40,345 | \$ 4,399,020 |
| 2028 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.72 | \$ 39,554 | \$ 4,438,574 |
| 2029 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.71 | \$ 38,778 | \$ 4,477,353 |
| 2030 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.69 | \$ 38,018 | \$ 4,515,371 |
| 2031 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.68 | \$ 37,273 | \$ 4,552,644 |
| 2032 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.67 | \$ 36,542 | \$ 4,589,185 |
| 2033 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.65 | \$ 35,825 | \$ 4,625,011 |
| 2034 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.64 | \$ 35,123 | \$ 4,660,134 |
| 2035 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.63 | \$ 34,434 | \$ 4,694,568 |
| 2036 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.62 | \$ 33,759 | \$ 4,728,327 |
| 2037 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.60 | \$ 33,097 | \$ 4,761,424 |
| 2038 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.59 | \$ 32,448 | \$ 4,793,872 |
| 2039 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.58 | \$ 31,812 | \$ 4,825,684 |
| 2040 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.57 | \$ 31,188 | \$ 4,856,872 |
| 2041 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.56 | \$ 30,577 | \$ 4,887,448 |
| 2042 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ (1,793,037) | \$ - | \$ (1,738,197) | 0.55 | \$ (950,153) | \$ 3,937,295 |
| TOTALS | \$ - | \$ 3,792,962 | \$ - | \$ - | \$ 19,555 | \$ - | \$ - | \$ 454,472 | \$ 417,849 | \$ 772,864 | \$ (1,793,037) | \$ - | \$ 3,664,666 | | \$ 3,937,295 | \$ 3,937,295 |

NOTES:

Alternative 1 Summary:

| | |
|--------------------|----------------|
| Capital Costs | \$ 3,812,517 |
| Recurring Costs | \$ 1,645,186 |
| Residual Value | \$ (1,793,037) |
| Non Discounted Sum | \$ 3,664,666 |
| Cum NPV | \$ 3,937,295 |

Key Assumptions:

| | | | |
|-----------------------------|------------------|---------------------------------|---|
| Discount Rate | 2.00% | Repairs and Maintenance | \$ 1.36 |
| Study Period | 30 years | Other Operations | \$ 2.51 |
| BaseYear | 2012 | Cleaning per sq. ft. | \$ 0.74 |
| Report Output | Constant Dollars | Roads and Grounds | \$ 0.51 |
| Cost per sq. ft. | \$370 | Administrative | \$ 1.27 |
| Construction Period (years) | 1 | BOMA Expense CPI Adjustment | 2.16% |
| Building Size (sq. ft.) | 10,251 | Effective utilities per sq. ft. | \$ 1.48 Not from BOMA; calculated based on treatment specific energy usage. |

Source: BAE Urban Economics, 2012.

Table 12: Schedule of Recurring Expenditures: 061-03 Modernization with HPS

| Year | Total Annual Expenditures | Electrical | | | Natural Gas | | | Water/Sewer (a) | | | | Other | |
|------|---------------------------|------------|---------|----------|-------------|-------|----------|-----------------|-------|---------|-------|-------|---------|
| | | Total Cost | kWh | \$/kWh | Total Cost | MMBtu | \$/MMBtu | Total Cost | Water | \$/Kgal | Waste | | \$/Kgal |
| 2012 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2013 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2014 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2015 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2016 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2017 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2018 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2019 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2020 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2021 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2022 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2023 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2024 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2025 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2026 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2027 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2028 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2029 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2030 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2031 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2032 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2033 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2034 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2035 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2036 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2037 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2038 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2039 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2040 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2041 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2042 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |

Notes:

(a) Water and sewer combined and calculated on square foot basis based upon BOMA ERR data.

- CPI adjustment factor: 2.16% bring 2011 BOMA ERR data to 2012 dollars.
- Water/sewer utility expense \$0.15 per sq. ft.
- Building total sq. ft. 10,251

Source: BAE Urban Economics, 2012.

**Table 13: Depreciation Schedule & Residual Value: SJCA
061-03 Modernization with HPS**

| Period | Depreciation Schedule | Residual Value |
|--------|--------------------------|-------------------|
| 2012 | \$ - | \$ - |
| 2013 | \$ 3,792,962 | \$ - |
| 2014 | \$ 3,723,999 | \$ - |
| 2015 | \$ 3,655,036 | \$ - |
| 2016 | \$ 3,586,073 | \$ - |
| 2017 | \$ 3,517,110 | \$ - |
| 2018 | \$ 3,448,147 | \$ - |
| 2019 | \$ 3,379,184 | \$ - |
| 2020 | \$ 3,310,221 | \$ - |
| 2021 | \$ 3,241,258 | \$ - |
| 2022 | \$ 3,172,295 | \$ - |
| 2023 | \$ 3,103,333 | \$ - |
| 2024 | \$ 3,034,370 | \$ - |
| 2025 | \$ 2,965,407 | \$ - |
| 2026 | \$ 2,896,444 | \$ - |
| 2027 | \$ 2,827,481 | \$ - |
| 2028 | \$ 2,758,518 | \$ - |
| 2029 | \$ 2,689,555 | \$ - |
| 2030 | \$ 2,620,592 | \$ - |
| 2031 | \$ 2,551,629 | \$ - |
| 2032 | \$ 2,482,666 | \$ - |
| 2033 | \$ 2,413,703 | \$ - |
| 2034 | \$ 2,344,740 | \$ - |
| 2035 | \$ 2,275,777 | \$ - |
| 2036 | \$ 2,206,814 | \$ - |
| 2037 | \$ 2,137,851 | \$ - |
| 2038 | \$ 2,068,888 | \$ - |
| 2039 | \$ 1,999,925 | \$ - |
| 2040 | \$ 1,930,962 | \$ - |
| 2041 | \$ 1,862,000 | \$ - |
| 2042 | \$ 1,793,037 | \$ 1,793,037 |

NOTE:

Useful life of asset: 55 years

Source: BAE Urban Economics, Inc.

Table 14: NPV Calculation; Project Alternative 061-04: Modernization with AT/FP

| Mid Year | One Time | | | | | | | Recurring | | | Residual Value | | Net Present Value | | | |
|---------------|------------------|--------------|----------------------|------------|-----------|------------------|---------------------------|------------|------------|------------------|----------------|------|-------------------|------------|----------------|--------------|
| | New Construction | Major Repair | Temporary Facilities | Relocation | Demo | Site Preparation | Environmental Remediation | Utilities | Repairs | Other Operations | Building | Land | Undiscounted Sum | NPV Factor | Mid-Year | Cum NPV |
| 2012 | \$ - | \$ - | \$ - | \$ - | \$ 21,738 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 21,738 | 0.99 | \$ 21,524 | \$ 21,524 |
| 2013 | \$ - | \$ 4,238,482 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 4,293,321 | 0.97 | \$ 4,167,668 | \$ 4,189,192 |
| 2014 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.95 | \$ 52,191 | \$ 4,241,383 |
| 2015 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.93 | \$ 51,167 | \$ 4,292,550 |
| 2016 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.91 | \$ 50,164 | \$ 4,342,714 |
| 2017 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.90 | \$ 49,180 | \$ 4,391,895 |
| 2018 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.88 | \$ 48,216 | \$ 4,440,111 |
| 2019 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.86 | \$ 47,271 | \$ 4,487,382 |
| 2020 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.85 | \$ 46,344 | \$ 4,533,726 |
| 2021 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.83 | \$ 45,435 | \$ 4,579,161 |
| 2022 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.81 | \$ 44,544 | \$ 4,623,705 |
| 2023 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.80 | \$ 43,671 | \$ 4,667,376 |
| 2024 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.78 | \$ 42,815 | \$ 4,710,191 |
| 2025 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.77 | \$ 41,975 | \$ 4,752,166 |
| 2026 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.75 | \$ 41,152 | \$ 4,793,318 |
| 2027 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.74 | \$ 40,345 | \$ 4,833,663 |
| 2028 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.72 | \$ 39,554 | \$ 4,873,217 |
| 2029 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.71 | \$ 38,778 | \$ 4,911,995 |
| 2030 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.69 | \$ 38,018 | \$ 4,950,013 |
| 2031 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.68 | \$ 37,273 | \$ 4,987,286 |
| 2032 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.67 | \$ 36,542 | \$ 5,023,828 |
| 2033 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.65 | \$ 35,825 | \$ 5,059,653 |
| 2034 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.64 | \$ 35,123 | \$ 5,094,776 |
| 2035 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.63 | \$ 34,434 | \$ 5,129,210 |
| 2036 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.62 | \$ 33,759 | \$ 5,162,969 |
| 2037 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.60 | \$ 33,097 | \$ 5,196,066 |
| 2038 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.59 | \$ 32,448 | \$ 5,228,514 |
| 2039 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.58 | \$ 31,812 | \$ 5,260,326 |
| 2040 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.57 | \$ 31,188 | \$ 5,291,514 |
| 2041 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 54,840 | 0.56 | \$ 30,577 | \$ 5,322,091 |
| 2042 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,149 | \$ 13,928 | \$ 25,762 | \$ (2,003,646) | \$ - | \$ (1,948,806) | 0.55 | \$ (1,065,279) | \$ 4,256,812 |
| TOTALS | \$ - | \$ 4,238,482 | \$ - | \$ - | \$ 21,738 | \$ - | \$ - | \$ 454,472 | \$ 417,849 | \$ 772,864 | \$ (2,003,646) | \$ - | \$ 3,901,760 | | \$ 4,256,812 | \$ 4,256,812 |

NOTES:

Alternative 1 Summary:

| | |
|--------------------|----------------|
| Capital Costs | \$ 4,260,220 |
| Recurring Costs | \$ 1,645,186 |
| Residual Value | \$ (2,003,646) |
| Non Discounted Sum | \$ 3,901,760 |
| Cum NPV | \$ 4,256,812 |

Key Assumptions:

| | | | |
|-----------------------------|------------------|---------------------------------|---------|
| Discount Rate | 2.00% | Repairs and Maintenance | \$ 1.36 |
| Study Period | 30 years | Other Operations | \$ 2.51 |
| BaseYear | 2012 | Cleaning per sq. ft. | \$ 0.74 |
| Report Output | Constant Dollars | Roads and Grounds | \$ 0.51 |
| Cost per sq. ft. | \$413 | Administrative | \$ 1.27 |
| Construction Period (years) | 1 | BOMA Expense CPI Adjustment | 2.16% |
| Building Size (sq. ft.) | 10,251 | Effective utilities per sq. ft. | \$ 1.48 |

Not from BOMA; calculated based on treatment specific energy usage.

Source: BAE Urban Economics, 2012.

Table 15: Schedule of Recurring Expenditures: 061-04 Modernization with AT/FP

| Year | Total Annual Expenditures | Electrical | | | Natural Gas | | | Water/Sewer (a) | | | | Other | |
|------|---------------------------|------------|---------|----------|-------------|-------|----------|-----------------|-------|---------|-------|-------|---------|
| | | Total Cost | kWh | \$/kWh | Total Cost | MMBtu | \$/MMBtu | Total Cost | Water | \$/Kgal | Waste | | \$/Kgal |
| 2012 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2013 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2014 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2015 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2016 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2017 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2018 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2019 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2020 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2021 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2022 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2023 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2024 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2025 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2026 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2027 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2028 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2029 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2030 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2031 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2032 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2033 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2034 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2035 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2036 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2037 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2038 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2039 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2040 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2041 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2042 | \$ 15,149 | \$ 13,578 | 165,588 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |

Notes:

(a) Water and sewer combined and calculated on square foot basis based upon BOMA ERR data.

CPI adjustment factor: 2.16% bring 2011 BOMA ERR data to 2012 dollars.
 Water/sewer utility expense \$0.15 per sq. ft.
 Building total sq. ft. 10,251

Source: BAE Urban Economics, 2012.

**Table 16: Depreciation Schedule & Residual Value: SJCA
061-04 Modernization with AT/FP**

| Period | Depreciation Schedule | Residual Value |
|---------------|----------------------------------|---------------------------|
| 2012 | \$ - | \$ - |
| 2013 | \$ 4,238,482 | \$ - |
| 2014 | \$ 4,161,418 | \$ - |
| 2015 | \$ 4,084,355 | \$ - |
| 2016 | \$ 4,007,292 | \$ - |
| 2017 | \$ 3,930,228 | \$ - |
| 2018 | \$ 3,853,165 | \$ - |
| 2019 | \$ 3,776,102 | \$ - |
| 2020 | \$ 3,699,038 | \$ - |
| 2021 | \$ 3,621,975 | \$ - |
| 2022 | \$ 3,544,912 | \$ - |
| 2023 | \$ 3,467,849 | \$ - |
| 2024 | \$ 3,390,785 | \$ - |
| 2025 | \$ 3,313,722 | \$ - |
| 2026 | \$ 3,236,659 | \$ - |
| 2027 | \$ 3,159,595 | \$ - |
| 2028 | \$ 3,082,532 | \$ - |
| 2029 | \$ 3,005,469 | \$ - |
| 2030 | \$ 2,928,405 | \$ - |
| 2031 | \$ 2,851,342 | \$ - |
| 2032 | \$ 2,774,279 | \$ - |
| 2033 | \$ 2,697,216 | \$ - |
| 2034 | \$ 2,620,152 | \$ - |
| 2035 | \$ 2,543,089 | \$ - |
| 2036 | \$ 2,466,026 | \$ - |
| 2037 | \$ 2,388,962 | \$ - |
| 2038 | \$ 2,311,899 | \$ - |
| 2039 | \$ 2,234,836 | \$ - |
| 2040 | \$ 2,157,772 | \$ - |
| 2041 | \$ 2,080,709 | \$ - |
| 2042 | \$ 2,003,646 | \$ 2,003,646 |

NOTE:

Useful life of asset: 55.0 years

Source: BAE Urban Economics, Inc.

Table 17: South U.S. Urban Consumer Price Index

| Year | Index (1982=100) | Annual CPI % Change |
|-------------|-----------------------------|--------------------------------|
| 1993 | 140.80 | 3.15% |
| 1994 | 144.70 | 2.77% |
| 1995 | 149.00 | 2.97% |
| 1996 | 153.60 | 3.09% |
| 1997 | 156.90 | 2.15% |
| 1998 | 158.90 | 1.27% |
| 1999 | 162.00 | 1.95% |
| 2000 | 167.20 | 3.21% |
| 2001 | 171.10 | 2.33% |
| 2002 | 173.30 | 1.29% |
| 2003 | 177.30 | 2.31% |
| 2004 | 181.80 | 2.54% |
| 2005 | 188.30 | 3.58% |
| 2006 | 194.70 | 3.40% |
| 2007 | 200.36 | 2.91% |
| 2008 | 208.68 | 4.15% |
| 2009 | 207.85 | -0.40% |
| 2010 | 211.34 | 1.68% |
| 2011 | 218.62 | 3.44% |
| 2012 | 223.34 | 2.16% |

Annual Average**20-years: 2.5%****LCCA Assumption: 0.0%**

Sources: U.S. Department of Labor, Bureau of Labor Statistics;
BAE Urban Economics, Inc. 2012.

Table 18: Discount Rates and Factors

| Year | Discount Factors | | Beginning of Year | Calendar Year |
|------|------------------|----------|----------------------|------------------|
| | End of Year | Mid-Year | | |
| 1 | 0.9804 | 0.9901 | 1.0000 | 2012 |
| 2 | 0.9612 | 0.9707 | 0.9804 | 2013 |
| 3 | 0.9423 | 0.9517 | 0.9612 | 2014 |
| 4 | 0.9238 | 0.9330 | 0.9423 | 2015 |
| 5 | 0.9057 | 0.9147 | 0.9238 | 2016 |
| 6 | 0.8880 | 0.8968 | 0.9057 | 2017 |
| 7 | 0.8706 | 0.8792 | 0.8880 | 2018 |
| 8 | 0.8535 | 0.8620 | 0.8706 | 2019 |
| 9 | 0.8368 | 0.8451 | 0.8535 | 2020 |
| 10 | 0.8203 | 0.8285 | 0.8368 | 2021 |
| 11 | 0.8043 | 0.8123 | 0.8203 | 2022 |
| 12 | 0.7885 | 0.7963 | 0.8043 | 2023 |
| 13 | 0.7730 | 0.7807 | 0.7885 | 2024 |
| 14 | 0.7579 | 0.7654 | 0.7730 | 2025 |
| 15 | 0.7430 | 0.7504 | 0.7579 | 2026 |
| 16 | 0.7284 | 0.7357 | 0.7430 | 2027 |
| 17 | 0.7142 | 0.7213 | 0.7284 | 2028 |
| 18 | 0.7002 | 0.7071 | 0.7142 | 2029 |
| 19 | 0.6864 | 0.6933 | 0.7002 | 2030 |
| 20 | 0.6730 | 0.6797 | 0.6864 | 2031 |
| 21 | 0.6598 | 0.6663 | 0.6730 | 2032 |
| 22 | 0.6468 | 0.6533 | 0.6598 | 2033 |
| 23 | 0.6342 | 0.6405 | 0.6468 | 2034 |
| 24 | 0.6217 | 0.6279 | 0.6342 | 2035 |
| 25 | 0.6095 | 0.6156 | 0.6217 | 2036 |
| 26 | 0.5976 | 0.6035 | 0.6095 | 2037 |
| 27 | 0.5859 | 0.5917 | 0.5976 | 2038 |
| 28 | 0.5744 | 0.5801 | 0.5859 | 2039 |
| 29 | 0.5631 | 0.5687 | 0.5744 | 2040 |
| 30 | 0.5521 | 0.5576 | 0.5631 | 2041 |
| 31 | 0.5412 | 0.5466 | 0.5521 | 2042 |

Notes:

30-Year real discount rate 2.0%

Mid-year factor: 1.0100

Sources: Office of Management and Budget, OMB Circular A-94,
Appendix C; BAE Urban Economics, 2012.

Life Cycle Cost Analysis (LCCA) Spreadsheet

St. Juliens Creek Annex, Chesapeake VA

**ESTCP SI 0931
LCCA Demonstration**

Non-Historic Building 168

Mission: General Administrative Office

Prepared by:
BAE Urban Economics, Inc.

December 2012

Table III-31: Life Cycle Cost Analysis Summary: SJCA 168

| Alternative | Non Discounted Costs by Component | | | Total Costs | | |
|--|-----------------------------------|--------------|----------------|----------------|---------------|---------------------------|
| | Initial Investment | Recurring | Residual Value | Non Discounted | No GHG Factor | Discounted - w/GHG Factor |
| SJCA 168-01: Status Quo - Sustainment | \$ 359,745 | \$ 1,976,528 | \$ - | \$ 2,336,274 | \$ 1,810,253 | \$ 1,911,792 |
| SJCA 168-02: Demolition and New Construction | \$ 4,807,667 | \$ 1,658,285 | \$ (2,117,113) | \$ 4,348,840 | \$ 4,741,864 | \$ 4,832,630 |
| SJCA 168-03: Modernization with HPS | \$ 3,537,950 | \$ 1,656,126 | \$ (1,657,701) | \$ 3,536,374 | \$ 3,753,056 | \$ 3,827,062 |
| SJCA 168-04: Modernization with AT/FP | \$ 3,525,624 | \$ 1,662,772 | \$ (1,650,219) | \$ 3,538,177 | \$ 3,751,201 | \$ 3,826,888 |

Notes

| | |
|--|----------|
| Study Period (years): | 30 |
| Real Discount Rate: | 2.00% |
| Average CO _{2e} Value/MT (undiscounted) | \$ 37.27 |
| Base Date: | 10/01/12 |

Source: BAE Urban Economics, 2012.

Table III-32: Greenhouse Gas Valuation Summary: SJCA 168

| Alternative | GHG Emissions by Scope (MT CO _{2e}) | | | | GHG Value | |
|--|---|----------|---------|----------|----------------|------------|
| | Scope 1 | Scope 2 | Scope 3 | Total | Non Discounted | Discounted |
| SJCA 168-01: Status Quo - Sustainment | - | 3,877.09 | 43.93 | 3,921.02 | \$ 146,484 | \$ 101,539 |
| SJCA 168-02: Demolition and New Construction | - | 2,206.49 | 897.60 | 3,104.09 | \$ 115,580 | \$ 90,766 |
| SJCA 168-03: Modernization with HPS | - | 2,195.42 | 476.47 | 2,671.90 | \$ 99,620 | \$ 74,005 |
| SJCA 168-04: Modernization with AT/FP | - | 2,206.76 | 483.36 | 2,690.11 | \$ 100,297 | \$ 75,687 |

Notes:

| | |
|--|----------|
| Study Period (years): | 30 |
| Real Discount Rate: | 2.00% |
| Average CO _{2e} Value/MT (undiscounted) | \$ 37.27 |
| Base Date: | 10/01/12 |

Sources: Center for Resource Solutions; BAE Urban Economics, 2012.

Table 3: Alternatives Summary: SJCA 168

| Project Alternative | Building GSF | | Building Features | | Construction Cost | |
|--|--------------|-----------|-------------------|-------|-------------------|--------|
| | Total | Footprint | LEED | AT/FP | Total | Per SF |
| SJCA 168-01: Sustainment - Status Quo | 10,251 | 10,251 | n/a | No | \$ 359,745 | \$ 35 |
| SJCA 168-02: Demolition & New Construction | 10,251 | 10,251 | 53 | Yes | \$ 4,807,667 | \$ 469 |
| SJCA 168-03: Modernization with HPS | 10,251 | 10,251 | 59 | Yes | \$ 3,537,950 | \$ 345 |
| SJCA 168-04: Modernization with AT/FP | 10,251 | 10,251 | 59 | Yes+ | \$ 3,525,624 | \$ 344 |

Note:

+ Current prescriptive practices and treatments.

Sources: Preservation Associates; Center for Resource Solutions; BAE Urban Economics, 2012.

Table 4: Construction Cost Summary: SJCA 168

| Category | Cost Estimate | | | |
|--------------------------------|-----------------------------------|--|----------------------------------|------------------------------------|
| | 01. Sustainment- Status Quo | 02. Demolition and New Construction | 03. Modernization with HPS | 04. Modernization with AT/FP |
| Demolition | \$ - | \$ 329,160 | \$ 31,275 | \$ 34,775 |
| Substructure | \$ 66,000 | \$ 395,787 | \$ 63,960 | \$ 127,960 |
| Shell | \$ 28,830 | \$ 961,102 | \$ 626,067 | \$ 613,731 |
| Interiors | \$ 77,248 | \$ 267,828 | \$ 339,650 | \$ 339,650 |
| Services | \$ 85,573 | \$ 978,953 | \$ 1,104,111 | \$ 1,048,060 |
| Sitework | \$ - | \$ 322,787 | \$ 273,487 | \$ 265,633 |
| Special Construction | \$ - | \$ 10,800 | \$ 51,636 | \$ 51,636 |
| Hard cost subtotal | \$ 257,651 | \$ 3,266,417 | \$ 2,490,186 | \$ 2,481,445 |
| General conditions (25%) | \$ 64,413 | \$ 934,234 | \$ 633,474 | \$ 631,267 |
| Security escalation (2%0 | \$ - | \$ 60,490 | \$ 43,708 | \$ 43,621 |
| USACE design (6%) | \$ 19,324 | \$ 280,270 | \$ 190,042 | \$ 189,380 |
| USACE SOIH (5.7%) | \$ 18,358 | \$ 266,257 | \$ 180,540 | \$ 179,911 |
| Soft cost subtotal | \$ 102,094 | \$ 1,541,250 | \$ 1,047,764 | \$ 1,044,178 |
| Construction cost total | \$ 359,745 | \$ 4,807,667 | \$ 3,537,950 | \$ 3,525,624 |
| Construction cost PSF | \$ 35 | \$ 469 | \$ 345 | \$ 344 |
| % Difference from 02 | -93% | N/A | -26% | -27% |

Sources: Preservation Associates; Center for Resource Solutions; BAE Urban Economics, 2012.

Table 5: NPV Calculation 168-01 Sustainment-Status Quo

| Mid Year | One Time | | | | | | | Recurring | | | Residual Value | | Net Present Value | | | |
|---------------|------------------|--------------|----------------------|------------|------|------------------|---------------------------|------------|---------------------|------------------|----------------|------|-------------------|------------|--------------|--------------|
| | New Construction | Major Repair | Temporary Facilities | Relocation | Demo | Site Preparation | Environmental Remediation | Utilities | Repairs Maintenance | Other Operations | Building | Land | Undiscounted Sum | NPV Factor | Mid-Year | Cum NPV |
| 2012 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | 0.99 | \$ - | \$ - |
| 2013 | \$ - | \$ 359,745 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 26,194 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 425,630 | 0.97 | \$ 413,173 | \$ 413,173 |
| 2014 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 26,194 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,884 | 0.95 | \$ 62,702 | \$ 475,875 |
| 2015 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 26,194 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,884 | 0.93 | \$ 61,473 | \$ 537,347 |
| 2016 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 26,194 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,884 | 0.91 | \$ 60,267 | \$ 597,615 |
| 2017 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 26,194 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,884 | 0.90 | \$ 59,085 | \$ 656,700 |
| 2018 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 26,194 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,884 | 0.88 | \$ 57,927 | \$ 714,627 |
| 2019 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 26,194 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,884 | 0.86 | \$ 56,791 | \$ 771,418 |
| 2020 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 26,194 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,884 | 0.85 | \$ 55,678 | \$ 827,096 |
| 2021 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 26,194 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,884 | 0.83 | \$ 54,586 | \$ 881,682 |
| 2022 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 26,194 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,884 | 0.81 | \$ 53,516 | \$ 935,197 |
| 2023 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 26,194 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,884 | 0.80 | \$ 52,466 | \$ 987,663 |
| 2024 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 26,194 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,884 | 0.78 | \$ 51,437 | \$ 1,039,101 |
| 2025 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 26,194 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,884 | 0.77 | \$ 50,429 | \$ 1,089,530 |
| 2026 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 26,194 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,884 | 0.75 | \$ 49,440 | \$ 1,138,970 |
| 2027 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 26,194 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,884 | 0.74 | \$ 48,471 | \$ 1,187,440 |
| 2028 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 26,194 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,884 | 0.72 | \$ 47,520 | \$ 1,234,961 |
| 2029 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 26,194 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,884 | 0.71 | \$ 46,589 | \$ 1,281,549 |
| 2030 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 26,194 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,884 | 0.69 | \$ 45,675 | \$ 1,327,224 |
| 2031 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 26,194 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,884 | 0.68 | \$ 44,779 | \$ 1,372,004 |
| 2032 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 26,194 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,884 | 0.67 | \$ 43,901 | \$ 1,415,905 |
| 2033 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 26,194 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,884 | 0.65 | \$ 43,041 | \$ 1,458,946 |
| 2034 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 26,194 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,884 | 0.64 | \$ 42,197 | \$ 1,501,142 |
| 2035 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 26,194 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,884 | 0.63 | \$ 41,369 | \$ 1,542,511 |
| 2036 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 26,194 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,884 | 0.62 | \$ 40,558 | \$ 1,583,070 |
| 2037 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 26,194 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,884 | 0.60 | \$ 39,763 | \$ 1,622,832 |
| 2038 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 26,194 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,884 | 0.59 | \$ 38,983 | \$ 1,661,816 |
| 2039 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 26,194 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,884 | 0.58 | \$ 38,219 | \$ 1,700,034 |
| 2040 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 26,194 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,884 | 0.57 | \$ 37,469 | \$ 1,737,504 |
| 2041 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 26,194 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,884 | 0.56 | \$ 36,735 | \$ 1,774,239 |
| 2042 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 26,194 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 65,884 | 0.55 | \$ 36,014 | \$ 1,810,253 |
| TOTALS | \$ - | \$ 359,745 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 785,815 | \$ 417,849 | \$ 772,864 | \$ - | \$ - | \$ 2,336,274 | | \$ 1,810,253 | \$ 1,810,253 |

NOTES:

Project Alternative Summary

| | |
|--------------------|--------------|
| Capital Costs | \$ 359,745 |
| Recurring Costs | \$ 1,976,528 |
| Residual Value | \$ - |
| Non Discounted Sum | \$ 2,336,274 |
| Cum NPV | \$ 1,810,253 |

Key Assumptions:

| | | | |
|-----------------------------|------------------|---------------------------------|---------|
| Discount Rate | 2.00% | Repairs and Maintenance | \$ 1.36 |
| Study Period | 30 years | Other Operations | \$ 2.51 |
| BaseYear | 2012 | Cleaning per sq. ft. | \$ 0.74 |
| Report Output | Constant Dollars | Roads and Grounds | \$ 0.51 |
| Cost per sq. ft. | \$35 | Administrative | \$ 1.27 |
| Construction Period (years) | 1 | BOMA Expense CPI Adjustment | 2.16% |
| Building Size (sq. ft.) | 10,251 | Effective utilities per sq. ft. | \$ 2.56 |

Not from BOMA; calculated based on treatment specific energy usage.

Source: BAE Urban Economics, 2012.

Table 6: Schedule of Recurring Expenditures SJCA 168-01 Sustainment-Status Quo

| Year | Total Annual Expenditures | Electrical | | | Natural Gas | | | Water/Sewer (a) | | | | Other | |
|------|---------------------------|------------|---------|---------|-------------|-------|----------|-----------------|-------|---------|-------|-------|---------|
| | | Total Cost | kWh | \$/kWh | Total Cost | MMBtu | \$/MMBtu | Total Cost | Water | \$/Kgal | Waste | | \$/Kgal |
| 2012 | \$ 26,194 | \$ 24,623 | 300,280 | \$0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2013 | \$ 26,194 | \$ 24,623 | 300,280 | \$0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2014 | \$ 26,194 | \$ 24,623 | 300,280 | \$0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2015 | \$ 26,194 | \$ 24,623 | 300,280 | \$0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2016 | \$ 26,194 | \$ 24,623 | 300,280 | \$0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2017 | \$ 26,194 | \$ 24,623 | 300,280 | \$0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2018 | \$ 26,194 | \$ 24,623 | 300,280 | \$0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2019 | \$ 26,194 | \$ 24,623 | 300,280 | \$0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2020 | \$ 26,194 | \$ 24,623 | 300,280 | \$0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2021 | \$ 26,194 | \$ 24,623 | 300,280 | \$0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2022 | \$ 26,194 | \$ 24,623 | 300,280 | \$0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2023 | \$ 26,194 | \$ 24,623 | 300,280 | \$0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2024 | \$ 26,194 | \$ 24,623 | 300,280 | \$0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2025 | \$ 26,194 | \$ 24,623 | 300,280 | \$0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2026 | \$ 26,194 | \$ 24,623 | 300,280 | \$0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2027 | \$ 26,194 | \$ 24,623 | 300,280 | \$0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2028 | \$ 26,194 | \$ 24,623 | 300,280 | \$0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2029 | \$ 26,194 | \$ 24,623 | 300,280 | \$0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2030 | \$ 26,194 | \$ 24,623 | 300,280 | \$0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2031 | \$ 26,194 | \$ 24,623 | 300,280 | \$0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2032 | \$ 26,194 | \$ 24,623 | 300,280 | \$0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2033 | \$ 26,194 | \$ 24,623 | 300,280 | \$0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2034 | \$ 26,194 | \$ 24,623 | 300,280 | \$0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2035 | \$ 26,194 | \$ 24,623 | 300,280 | \$0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2036 | \$ 26,194 | \$ 24,623 | 300,280 | \$0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2037 | \$ 26,194 | \$ 24,623 | 300,280 | \$0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2038 | \$ 26,194 | \$ 24,623 | 300,280 | \$0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2039 | \$ 26,194 | \$ 24,623 | 300,280 | \$0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2040 | \$ 26,194 | \$ 24,623 | 300,280 | \$0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2041 | \$ 26,194 | \$ 24,623 | 300,280 | \$0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2042 | \$ 26,194 | \$ 24,623 | 300,280 | \$0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |

Notes:

- (a) Water and sewer combined and calculated on square foot basis based upon BOMA ERR data.
 - CPI adjustment factor: 2.16% bring 2011 BOMA ERR data to 2012 dollars.
 - Water/sewer utility expense \$0.15 per sq. ft.
 - Building total sq. ft. 10,251

Source: BAE Urban Economics, 2012.

**Table 7: Depreciation Schedule & Residual Value SJCA
168-01: Sustainment-Status Quo**

| Period | Depreciation Schedule | Residual Value |
|---------------|----------------------------------|---------------------------|
| 2012 | \$ - | \$ - |
| 2013 | \$ 359,745 | \$ - |
| 2014 | \$ 335,762 | \$ - |
| 2015 | \$ 311,779 | \$ - |
| 2016 | \$ 287,796 | \$ - |
| 2017 | \$ 263,813 | \$ - |
| 2018 | \$ 239,830 | \$ - |
| 2019 | \$ 215,847 | \$ - |
| 2020 | \$ 191,864 | \$ - |
| 2021 | \$ 167,881 | \$ - |
| 2022 | \$ 143,898 | \$ - |
| 2023 | \$ 119,915 | \$ - |
| 2024 | \$ 95,932 | \$ - |
| 2025 | \$ 71,949 | \$ - |
| 2026 | \$ 47,966 | \$ - |
| 2027 | \$ 23,983 | \$ - |
| 2028 | \$ - | \$ - |
| 2029 | \$ - | \$ - |
| 2030 | \$ - | \$ - |
| 2031 | \$ - | \$ - |
| 2032 | \$ - | \$ - |
| 2033 | \$ - | \$ - |
| 2034 | \$ - | \$ - |
| 2035 | \$ - | \$ - |
| 2036 | \$ - | \$ - |
| 2037 | \$ - | \$ - |
| 2038 | \$ - | \$ - |
| 2039 | \$ - | \$ - |
| 2040 | \$ - | \$ - |
| 2041 | \$ - | \$ - |
| 2042 | \$ - | \$ - |

Note:

Useful life of asset: 15.0 years

Source: BAE Urban Economics, Inc. 2012.

Table 8: NPV Calculation 168-02: Demolition and New Construction

| Mid Year | One Time | | | | | | | Recurring | | | Residual Value | | Net Present Value | | | |
|---------------|------------------|--------------|----------------------|------------|------------|------------------|---------------------------|------------|------------|------------------|----------------|------|-------------------|------------|----------------|--------------|
| | New Construction | Major Repair | Temporary Facilities | Relocation | Demo | Site Preparation | Environmental Remediation | Utilities | Repairs | Other Operations | Building | Land | Undiscounted Sum | NPV Factor | Mid-Year | Cum NPV |
| 2012 | \$ - | \$ - | \$ - | \$ - | \$ 329,160 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 329,160 | 0.99 | \$ 325,917 | \$ 325,917 |
| 2013 | \$ - | \$ 4,478,508 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 4,533,784 | 0.97 | \$ 4,401,093 | \$ 4,727,010 |
| 2014 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.95 | \$ 52,606 | \$ 4,779,616 |
| 2015 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.93 | \$ 51,575 | \$ 4,831,191 |
| 2016 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.91 | \$ 50,564 | \$ 4,881,754 |
| 2017 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.90 | \$ 49,572 | \$ 4,931,326 |
| 2018 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.88 | \$ 48,600 | \$ 4,979,926 |
| 2019 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.86 | \$ 47,647 | \$ 5,027,574 |
| 2020 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.85 | \$ 46,713 | \$ 5,074,286 |
| 2021 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.83 | \$ 45,797 | \$ 5,120,083 |
| 2022 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.81 | \$ 44,899 | \$ 5,164,982 |
| 2023 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.80 | \$ 44,019 | \$ 5,209,001 |
| 2024 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.78 | \$ 43,155 | \$ 5,252,156 |
| 2025 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.77 | \$ 42,309 | \$ 5,294,466 |
| 2026 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.75 | \$ 41,480 | \$ 5,335,945 |
| 2027 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.74 | \$ 40,666 | \$ 5,376,612 |
| 2028 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.72 | \$ 39,869 | \$ 5,416,481 |
| 2029 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.71 | \$ 39,087 | \$ 5,455,568 |
| 2030 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.69 | \$ 38,321 | \$ 5,493,889 |
| 2031 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.68 | \$ 37,569 | \$ 5,531,458 |
| 2032 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.67 | \$ 36,833 | \$ 5,568,291 |
| 2033 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.65 | \$ 36,111 | \$ 5,604,402 |
| 2034 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.64 | \$ 35,403 | \$ 5,639,804 |
| 2035 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.63 | \$ 34,708 | \$ 5,674,512 |
| 2036 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.62 | \$ 34,028 | \$ 5,708,540 |
| 2037 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.60 | \$ 33,361 | \$ 5,741,901 |
| 2038 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.59 | \$ 32,706 | \$ 5,774,607 |
| 2039 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.58 | \$ 32,065 | \$ 5,806,672 |
| 2040 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.57 | \$ 31,436 | \$ 5,838,109 |
| 2041 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.56 | \$ 30,820 | \$ 5,868,929 |
| 2042 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ (2,117,113) | \$ - | \$ (2,061,837) | 0.55 | \$ (1,127,065) | \$ 4,741,864 |
| TOTALS | \$ - | \$ 4,478,508 | \$ - | \$ - | \$ 329,160 | \$ - | \$ - | \$ 467,572 | \$ 417,849 | \$ 772,864 | \$ (2,117,113) | \$ - | \$ 4,348,840 | | \$ 4,741,864 | \$ 4,741,864 |

Notes:

Project Alternative Summary

| | |
|--------------------|----------------|
| Capital Costs | \$ 4,807,667 |
| Recurring Costs | \$ 1,658,285 |
| Residual Value | \$ (2,117,113) |
| Non Discounted Sum | \$ 4,348,840 |
| Cum NPV | \$ 4,741,864 |

Key Assumptions:

| | | | |
|-----------------------------|------------------|---------------------------------|---------|
| Discount Rate | 2.00% | Repairs and Maintenance | \$ 1.36 |
| Study Period | 25 years | Other Operations | \$ 2.51 |
| BaseYear | 2012 | Cleaning per sq. ft. | \$ 0.74 |
| Report Output | Constant Dollars | Roads and Grounds | \$ 0.51 |
| Cost per sq. ft. | \$437 | Administrative | \$ 1.27 |
| Construction Period (years) | 1 | BOMA Expense CPI Adjustment | 2.16% |
| Building Size (sq. ft.) | 10,251 | Effective utilities per sq. ft. | \$ 1.52 |

Not from BOMA; calculated based on treatment specific energy usag

Source: BAE Urban Economics, 2012.

Table 9: Schedule of Recurring Expenditures: SJCA 168-02 Demolition and New Construction

| Year | Total Annual Expenditures | Electrical | | | Natural Gas | | | Water/Sewer (a) | | | | Other | |
|------|---------------------------|------------|---------|----------|-------------|-------|----------|-----------------|-------|---------|-------|-------|---------|
| | | Total Cost | kWh | \$/kWh | Total Cost | MMBtu | \$/MMBtu | Total Cost | Water | \$/Kgal | Waste | | \$/Kgal |
| 2012 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2013 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2014 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2015 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2016 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2017 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2018 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2019 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2020 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2021 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2022 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2023 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2024 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2025 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2026 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2027 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2028 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2029 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2030 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2031 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2032 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2033 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2034 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2035 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2036 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2037 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2038 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2039 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2040 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2041 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2042 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |

Notes:

- (a) Water and sewer combined and calculated on square foot basis based upon BOMA ERR data.
 - CPI adjustment factor: 2.16% bring 2011 BOMA ERR data to 2012 dollars.
 - Water/sewer utility expense \$0.15 per sq. ft.
 - Building total sq. ft. 10,251

Source: BAE Urban Economics, 2012.

**Table 10: Depreciation Schedule & Residual Value: SJCA
168-02 Demolition and New Construction**

| Period | Depreciation Schedule | Residual Value |
|---------------|----------------------------------|---------------------------|
| 2012 | \$ - | \$ - |
| 2013 | \$ 4,478,508 | \$ - |
| 2014 | \$ 4,397,080 | \$ - |
| 2015 | \$ 4,315,653 | \$ - |
| 2016 | \$ 4,234,225 | \$ - |
| 2017 | \$ 4,152,798 | \$ - |
| 2018 | \$ 4,071,371 | \$ - |
| 2019 | \$ 3,989,943 | \$ - |
| 2020 | \$ 3,908,516 | \$ - |
| 2021 | \$ 3,827,088 | \$ - |
| 2022 | \$ 3,745,661 | \$ - |
| 2023 | \$ 3,664,234 | \$ - |
| 2024 | \$ 3,582,806 | \$ - |
| 2025 | \$ 3,501,379 | \$ - |
| 2026 | \$ 3,419,951 | \$ - |
| 2027 | \$ 3,338,524 | \$ - |
| 2028 | \$ 3,257,096 | \$ - |
| 2029 | \$ 3,175,669 | \$ - |
| 2030 | \$ 3,094,242 | \$ - |
| 2031 | \$ 3,012,814 | \$ - |
| 2032 | \$ 2,931,387 | \$ - |
| 2033 | \$ 2,849,959 | \$ - |
| 2034 | \$ 2,768,532 | \$ - |
| 2035 | \$ 2,687,105 | \$ - |
| 2036 | \$ 2,605,677 | \$ - |
| 2037 | \$ 2,524,250 | \$ - |
| 2038 | \$ 2,442,822 | \$ - |
| 2039 | \$ 2,361,395 | \$ - |
| 2040 | \$ 2,279,968 | \$ - |
| 2041 | \$ 2,198,540 | \$ - |
| 2042 | \$ 2,117,113 | \$ 2,117,113 |

Note:

Useful life of asset: 55.0 years

Source: BAE Urban Economics, Inc. 2012.

Table 11: NPV Calculation 168-03: Modernization with HPS

| Mid Year | One Time | | | | | | | Recurring | | | Residual Value | | Net Present Value | | | |
|----------|------------------|--------------|----------------------|------------|-----------|------------------|---------------------------|------------|---------------------|------------------|----------------|------|-------------------|------------|--------------|--------------|
| | New Construction | Major Repair | Temporary Facilities | Relocation | Demo | Site Preparation | Environmental Remediation | Utilities | Repairs Maintenance | Other Operations | Building | Land | Undiscounted Sum | NPV Factor | Mid-Year | Cum NPV |
| 2012 | \$ - | \$ - | \$ - | \$ - | \$ 31,275 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 31,275 | 0.99 | \$ 30,967 | \$ 30,967 |
| 2013 | \$ - | \$ 3,506,674 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,514 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 3,561,879 | 0.97 | \$ 3,457,633 | \$ 3,488,600 |
| 2014 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,514 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,204 | 0.95 | \$ 52,538 | \$ 3,541,138 |
| 2015 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,514 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,204 | 0.93 | \$ 51,508 | \$ 3,592,645 |
| 2016 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,514 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,204 | 0.91 | \$ 50,498 | \$ 3,643,143 |
| 2017 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,514 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,204 | 0.90 | \$ 49,508 | \$ 3,692,650 |
| 2018 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,514 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,204 | 0.88 | \$ 48,537 | \$ 3,741,187 |
| 2019 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,514 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,204 | 0.86 | \$ 47,585 | \$ 3,788,772 |
| 2020 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,514 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,204 | 0.85 | \$ 46,652 | \$ 3,835,424 |
| 2021 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,514 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,204 | 0.83 | \$ 45,737 | \$ 3,881,161 |
| 2022 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,514 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,204 | 0.81 | \$ 44,840 | \$ 3,926,002 |
| 2023 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,514 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,204 | 0.80 | \$ 43,961 | \$ 3,969,963 |
| 2024 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,514 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,204 | 0.78 | \$ 43,099 | \$ 4,013,062 |
| 2025 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,514 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,204 | 0.77 | \$ 42,254 | \$ 4,055,317 |
| 2026 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,514 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,204 | 0.75 | \$ 41,426 | \$ 4,096,742 |
| 2027 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,514 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,204 | 0.74 | \$ 40,613 | \$ 4,137,356 |
| 2028 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,514 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,204 | 0.72 | \$ 39,817 | \$ 4,177,173 |
| 2029 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,514 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,204 | 0.71 | \$ 39,036 | \$ 4,216,209 |
| 2030 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,514 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,204 | 0.69 | \$ 38,271 | \$ 4,254,480 |
| 2031 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,514 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,204 | 0.68 | \$ 37,521 | \$ 4,292,000 |
| 2032 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,514 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,204 | 0.67 | \$ 36,785 | \$ 4,328,785 |
| 2033 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,514 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,204 | 0.65 | \$ 36,064 | \$ 4,364,849 |
| 2034 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,514 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,204 | 0.64 | \$ 35,356 | \$ 4,400,205 |
| 2035 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,514 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,204 | 0.63 | \$ 34,663 | \$ 4,434,868 |
| 2036 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,514 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,204 | 0.62 | \$ 33,983 | \$ 4,468,852 |
| 2037 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,514 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,204 | 0.60 | \$ 33,317 | \$ 4,502,169 |
| 2038 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,514 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,204 | 0.59 | \$ 32,664 | \$ 4,534,833 |
| 2039 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,514 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,204 | 0.58 | \$ 32,023 | \$ 4,566,856 |
| 2040 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,514 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,204 | 0.57 | \$ 31,395 | \$ 4,598,252 |
| 2041 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,514 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,204 | 0.56 | \$ 30,780 | \$ 4,629,032 |
| 2042 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,514 | \$ 13,928 | \$ 25,762 | \$ (1,657,701) | \$ - | \$ (1,602,496) | 0.55 | \$ (875,975) | \$ 3,753,056 |
| TOTALS | \$ - | \$ 3,506,674 | \$ - | \$ - | \$ 31,275 | \$ - | \$ - | \$ 465,412 | \$ 417,849 | \$ 772,864 | \$ (1,657,701) | \$ - | \$ 3,536,374 | | \$ 3,753,056 | \$ 3,753,056 |

Notes:

Project Alternative Summary

| | |
|--------------------|----------------|
| Capital Costs | \$ 3,537,950 |
| Recurring Costs | \$ 1,656,126 |
| Residual Value | \$ (1,657,701) |
| Non Discounted Sum | \$ 3,536,374 |
| Cum NPV | \$ 3,753,056 |

Key Assumptions:

| | | | |
|-----------------------------|------------------|---------------------------------|--|
| Discount Rate | 2.00% | Repairs and Maintenance | \$ 1.36 |
| Study Period | 25 years | Other Operations | \$ 2.51 |
| BaseYear | 2007 | Cleaning per sq. ft. | \$ 0.74 |
| Report Output | Constant Dollars | Roads and Grounds | \$ 0.51 |
| Cost per sq. ft. | \$342 | Administrative | \$ 1.27 |
| Construction Period (years) | 1 | BOMA Expense CPI Adjustment | 2.16% |
| Building Size (sq. ft.) | 10,251 | Effective utilities per sq. ft. | \$ 1.51 Not from BOMA; calculated based on treatment specific energy usage |

Source: BAE Urban Economics, 2012.

Table 12: Schedule of Recurring Expenditures: 168-03 Modernization with HPS

| Year | Total Annual Expenditures | Electrical | | | Natural Gas | | | Water/Sewer (a) | | | | Other | |
|------|---------------------------|------------|---------|----------|-------------|-------|----------|-----------------|-------|---------|-------|-------|---------|
| | | Total Cost | kWh | \$/kWh | Total Cost | MMBtu | \$/MMBtu | Total Cost | Water | \$/Kgal | Waste | | \$/Kgal |
| 2012 | \$ 15,514 | \$ 13,943 | 170,035 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2013 | \$ 15,514 | \$ 13,943 | 170,035 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2014 | \$ 15,514 | \$ 13,943 | 170,035 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2015 | \$ 15,514 | \$ 13,943 | 170,035 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2016 | \$ 15,514 | \$ 13,943 | 170,035 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2017 | \$ 15,514 | \$ 13,943 | 170,035 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2018 | \$ 15,514 | \$ 13,943 | 170,035 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2019 | \$ 15,514 | \$ 13,943 | 170,035 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2020 | \$ 15,514 | \$ 13,943 | 170,035 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2021 | \$ 15,514 | \$ 13,943 | 170,035 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2022 | \$ 15,514 | \$ 13,943 | 170,035 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2023 | \$ 15,514 | \$ 13,943 | 170,035 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2024 | \$ 15,514 | \$ 13,943 | 170,035 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2025 | \$ 15,514 | \$ 13,943 | 170,035 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2026 | \$ 15,514 | \$ 13,943 | 170,035 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2027 | \$ 15,514 | \$ 13,943 | 170,035 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2028 | \$ 15,514 | \$ 13,943 | 170,035 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2029 | \$ 15,514 | \$ 13,943 | 170,035 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2030 | \$ 15,514 | \$ 13,943 | 170,035 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2031 | \$ 15,514 | \$ 13,943 | 170,035 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2032 | \$ 15,514 | \$ 13,943 | 170,035 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2033 | \$ 15,514 | \$ 13,943 | 170,035 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2034 | \$ 15,514 | \$ 13,943 | 170,035 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2035 | \$ 15,514 | \$ 13,943 | 170,035 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2036 | \$ 15,514 | \$ 13,943 | 170,035 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2037 | \$ 15,514 | \$ 13,943 | 170,035 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2038 | \$ 15,514 | \$ 13,943 | 170,035 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2039 | \$ 15,514 | \$ 13,943 | 170,035 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2040 | \$ 15,514 | \$ 13,943 | 170,035 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2041 | \$ 15,514 | \$ 13,943 | 170,035 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2042 | \$ 15,514 | \$ 13,943 | 170,035 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |

Notes:

- (a) Water and sewer combined and calculated on square foot basis based upon BOMA ERR data.
 - CPI adjustment factor: 2.16% bring 2011 BOMA ERR data to 2012 dollars.
 - Water/sewer utility expense \$0.15 per sq. ft.
 - Building total sq. ft. 10,251

Source: BAE Urban Economics, 2012.

**Table 13: Depreciation Schedule & Residual Value: SJCA
168-03 Modernization with HPS**

| Period | Depreciation Schedule | Residual Value |
|---------------|----------------------------------|---------------------------|
| 2012 | \$ - | \$ - |
| 2013 | \$ 3,506,674 | \$ - |
| 2014 | \$ 3,442,917 | \$ - |
| 2015 | \$ 3,379,159 | \$ - |
| 2016 | \$ 3,315,401 | \$ - |
| 2017 | \$ 3,251,644 | \$ - |
| 2018 | \$ 3,187,886 | \$ - |
| 2019 | \$ 3,124,128 | \$ - |
| 2020 | \$ 3,060,370 | \$ - |
| 2021 | \$ 2,996,613 | \$ - |
| 2022 | \$ 2,932,855 | \$ - |
| 2023 | \$ 2,869,097 | \$ - |
| 2024 | \$ 2,805,340 | \$ - |
| 2025 | \$ 2,741,582 | \$ - |
| 2026 | \$ 2,677,824 | \$ - |
| 2027 | \$ 2,614,066 | \$ - |
| 2028 | \$ 2,550,309 | \$ - |
| 2029 | \$ 2,486,551 | \$ - |
| 2030 | \$ 2,422,793 | \$ - |
| 2031 | \$ 2,359,036 | \$ - |
| 2032 | \$ 2,295,278 | \$ - |
| 2033 | \$ 2,231,520 | \$ - |
| 2034 | \$ 2,167,762 | \$ - |
| 2035 | \$ 2,104,005 | \$ - |
| 2036 | \$ 2,040,247 | \$ - |
| 2037 | \$ 1,976,489 | \$ - |
| 2038 | \$ 1,912,732 | \$ - |
| 2039 | \$ 1,848,974 | \$ - |
| 2040 | \$ 1,785,216 | \$ - |
| 2041 | \$ 1,721,458 | \$ - |
| 2042 | \$ 1,657,701 | \$ 1,657,701 |

Note:

Useful life of asset: 55.0 years

Source: BAE Urban Economics, Inc. 2012.

Table 14: NPV Calculation 061-04: Modernization with AT/FP

| Mid Year | One Time | | | | | | | Recurring | | | Residual Value | | Net Present Value | | | |
|----------|------------------|--------------|----------------------|------------|-----------|------------------|---------------------------|------------|---------------------|------------------|----------------|------|-------------------|------------|--------------|--------------|
| | New Construction | Major Repair | Temporary Facilities | Relocation | Demo | Site Preparation | Environmental Remediation | Utilities | Repairs Maintenance | Other Operations | Building | Land | Undiscounted Sum | NPV Factor | Mid-Year | Cum NPV |
| 2012 | \$ - | \$ - | \$ - | \$ - | \$ 34,775 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 34,775 | 0.99 | \$ 34,433 | \$ 34,433 |
| 2013 | \$ - | \$ 3,490,848 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 30,249 | \$ - | \$ - | \$ 3,550,612 | 0.97 | \$ 3,446,696 | \$ 3,481,128 |
| 2014 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.95 | \$ 52,606 | \$ 3,533,734 |
| 2015 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.93 | \$ 51,575 | \$ 3,585,309 |
| 2016 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.91 | \$ 50,564 | \$ 3,635,873 |
| 2017 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.90 | \$ 49,572 | \$ 3,685,445 |
| 2018 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.88 | \$ 48,600 | \$ 3,734,045 |
| 2019 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.86 | \$ 47,647 | \$ 3,781,692 |
| 2020 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.85 | \$ 46,713 | \$ 3,828,405 |
| 2021 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.83 | \$ 45,797 | \$ 3,874,202 |
| 2022 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.81 | \$ 44,899 | \$ 3,919,101 |
| 2023 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.80 | \$ 44,019 | \$ 3,963,119 |
| 2024 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.78 | \$ 43,155 | \$ 4,006,275 |
| 2025 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.77 | \$ 42,309 | \$ 4,048,584 |
| 2026 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.75 | \$ 41,480 | \$ 4,090,064 |
| 2027 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.74 | \$ 40,666 | \$ 4,130,730 |
| 2028 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.72 | \$ 39,869 | \$ 4,170,599 |
| 2029 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.71 | \$ 39,087 | \$ 4,209,686 |
| 2030 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.69 | \$ 38,321 | \$ 4,248,007 |
| 2031 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.68 | \$ 37,569 | \$ 4,285,577 |
| 2032 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.67 | \$ 36,833 | \$ 4,322,409 |
| 2033 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.65 | \$ 36,111 | \$ 4,358,520 |
| 2034 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.64 | \$ 35,403 | \$ 4,393,922 |
| 2035 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.63 | \$ 34,708 | \$ 4,428,631 |
| 2036 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.62 | \$ 34,028 | \$ 4,462,659 |
| 2037 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.60 | \$ 33,361 | \$ 4,496,019 |
| 2038 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.59 | \$ 32,706 | \$ 4,528,726 |
| 2039 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.58 | \$ 32,065 | \$ 4,560,791 |
| 2040 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.57 | \$ 31,436 | \$ 4,592,227 |
| 2041 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ - | \$ - | \$ 55,276 | 0.56 | \$ 30,820 | \$ 4,623,047 |
| 2042 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 15,586 | \$ 13,928 | \$ 25,762 | \$ (1,650,219) | \$ - | \$ (1,594,943) | 0.55 | \$ (871,846) | \$ 3,751,201 |
| TOTALS | \$ - | \$ 3,490,848 | \$ - | \$ - | \$ 34,775 | \$ - | \$ - | \$ 467,572 | \$ 417,849 | \$ 777,351 | \$ (1,650,219) | \$ - | \$ 3,538,177 | | \$ 3,751,201 | \$ 3,751,201 |

Notes

Project Alternative Summary

| | |
|--------------------|----------------|
| Capital Costs | \$ 3,525,624 |
| Recurring Costs | \$ 1,662,772 |
| Residual Value | \$ (1,650,219) |
| Non Discounted Sum | \$ 3,538,177 |
| Cum NPV | \$ 3,751,201 |

Key Assumptions:

| | | | |
|-----------------------------|------------------|---------------------------------|--|
| Discount Rate | 2.00% | Repairs and Maintenance | \$ 1.36 |
| Study Period | 25 years | Other Operations | \$ 2.51 |
| BaseYear | 2007 | Cleaning per sq. ft. | \$ 0.74 |
| Report Output | Constant Dollars | Roads and Grounds | \$ 0.51 |
| Cost per sq. ft. | \$341 | Administrative | \$ 1.27 |
| Construction Period (years) | 1 | BOMA Expense CPI Adjustment | 2.16% |
| Building Size (sq. ft.) | 10,251 | Effective utilities per sq. ft. | \$ 1.52 Not from BOMA; calculated based on treatment specific energy usage |

Source: BAE Urban Economics, 2012.

Table 15: Schedule of Recurring Expenditures: 168-04 Modernization with AT/FP

| Year | Total Annual Expenditures | Electrical | | | Natural Gas | | | Water/Sewer (a) | | | | | |
|------|---------------------------|------------|---------|----------|-------------|-------|----------|-----------------|-------|---------|-------|---------|-------|
| | | Total Cost | kWh | \$/kWh | Total Cost | MMBtu | \$/MMBtu | Total Cost | Water | \$/Kgal | Waste | \$/Kgal | Other |
| 2012 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2013 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2014 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2015 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2016 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2017 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2018 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2019 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2020 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2021 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2022 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2023 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2024 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2025 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2026 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2027 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2028 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2029 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2030 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2031 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2032 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2033 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2034 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2035 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2036 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2037 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2038 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2039 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2040 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2041 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |
| 2042 | \$ 15,586 | \$ 14,015 | 170,913 | \$ 0.082 | \$ - | | \$ - | \$ 1,571 | | | | | \$ - |

Notes:

- (a) Water and sewer combined and calculated on square foot basis based upon BOMA ERR data.
 - CPI adjustment factor: 2.16% bring 2011 BOMA ERR data to 2012 dollars.
 - Water/sewer utility expense \$0.15 per sq. ft.
 - Building total sq. ft. 10,251

Source: BAE Urban Economics, 2012.

**Table 16: Depreciation Schedule & Residual Value: SJCA
168-04 Modernization with AT/FP**

| Period | Depreciation Schedule | Residual Value |
|---------------|----------------------------------|---------------------------|
| 2012 | \$ - | \$ - |
| 2013 | \$ 3,490,848 | \$ - |
| 2014 | \$ 3,427,379 | \$ - |
| 2015 | \$ 3,363,909 | \$ - |
| 2016 | \$ 3,300,439 | \$ - |
| 2017 | \$ 3,236,969 | \$ - |
| 2018 | \$ 3,173,499 | \$ - |
| 2019 | \$ 3,110,029 | \$ - |
| 2020 | \$ 3,046,559 | \$ - |
| 2021 | \$ 2,983,089 | \$ - |
| 2022 | \$ 2,919,619 | \$ - |
| 2023 | \$ 2,856,149 | \$ - |
| 2024 | \$ 2,792,679 | \$ - |
| 2025 | \$ 2,729,209 | \$ - |
| 2026 | \$ 2,665,739 | \$ - |
| 2027 | \$ 2,602,269 | \$ - |
| 2028 | \$ 2,538,799 | \$ - |
| 2029 | \$ 2,475,329 | \$ - |
| 2030 | \$ 2,411,859 | \$ - |
| 2031 | \$ 2,348,389 | \$ - |
| 2032 | \$ 2,284,919 | \$ - |
| 2033 | \$ 2,221,449 | \$ - |
| 2034 | \$ 2,157,979 | \$ - |
| 2035 | \$ 2,094,509 | \$ - |
| 2036 | \$ 2,031,039 | \$ - |
| 2037 | \$ 1,967,569 | \$ - |
| 2038 | \$ 1,904,099 | \$ - |
| 2039 | \$ 1,840,629 | \$ - |
| 2040 | \$ 1,777,159 | \$ - |
| 2041 | \$ 1,713,689 | \$ - |
| 2042 | \$ 1,650,219 | \$ 1,650,219 |

Note:

Useful life of asset: 55.0 years

Source: BAE Urban Economics, Inc. 2012.

Table 17: South U.S. Urban Consumer Price Index

| Year | Index (1982=100) | Annual CPI % Change |
|-------------|-----------------------------|--------------------------------|
| 1993 | 140.80 | 3.15% |
| 1994 | 144.70 | 2.77% |
| 1995 | 149.00 | 2.97% |
| 1996 | 153.60 | 3.09% |
| 1997 | 156.90 | 2.15% |
| 1998 | 158.90 | 1.27% |
| 1999 | 162.00 | 1.95% |
| 2000 | 167.20 | 3.21% |
| 2001 | 171.10 | 2.33% |
| 2002 | 173.30 | 1.29% |
| 2003 | 177.30 | 2.31% |
| 2004 | 181.80 | 2.54% |
| 2005 | 188.30 | 3.58% |
| 2006 | 194.70 | 3.40% |
| 2007 | 200.36 | 2.91% |
| 2008 | 208.68 | 4.15% |
| 2009 | 207.85 | -0.40% |
| 2010 | 211.34 | 1.68% |
| 2011 | 218.62 | 3.44% |
| 2012 | 223.34 | 2.16% |

Annual Average**20-years: 2.5%****LCCA Assumption: 0.0%**

Source: U.S. Department of Labor, Bureau of Labor
Statistics; BAE Urban Economics, Inc. 2012.

Table 18: Discount Rates and Factors

| Year | Discount Factors | | Beginning of Year | Calander Year |
|------|------------------|----------|----------------------|------------------|
| | End of Year | Mid-Year | | |
| 1 | 0.9804 | 0.9901 | 1.0000 | 2012 |
| 2 | 0.9612 | 0.9707 | 0.9804 | 2013 |
| 3 | 0.9423 | 0.9517 | 0.9612 | 2014 |
| 4 | 0.9238 | 0.9330 | 0.9423 | 2015 |
| 5 | 0.9057 | 0.9147 | 0.9238 | 2016 |
| 6 | 0.8880 | 0.8968 | 0.9057 | 2017 |
| 7 | 0.8706 | 0.8792 | 0.8880 | 2018 |
| 8 | 0.8535 | 0.8620 | 0.8706 | 2019 |
| 9 | 0.8368 | 0.8451 | 0.8535 | 2020 |
| 10 | 0.8203 | 0.8285 | 0.8368 | 2021 |
| 11 | 0.8043 | 0.8123 | 0.8203 | 2022 |
| 12 | 0.7885 | 0.7963 | 0.8043 | 2023 |
| 13 | 0.7730 | 0.7807 | 0.7885 | 2024 |
| 14 | 0.7579 | 0.7654 | 0.7730 | 2025 |
| 15 | 0.7430 | 0.7504 | 0.7579 | 2026 |
| 16 | 0.7284 | 0.7357 | 0.7430 | 2027 |
| 17 | 0.7142 | 0.7213 | 0.7284 | 2028 |
| 18 | 0.7002 | 0.7071 | 0.7142 | 2029 |
| 19 | 0.6864 | 0.6933 | 0.7002 | 2030 |
| 20 | 0.6730 | 0.6797 | 0.6864 | 2031 |
| 21 | 0.6598 | 0.6663 | 0.6730 | 2032 |
| 22 | 0.6468 | 0.6533 | 0.6598 | 2033 |
| 23 | 0.6342 | 0.6405 | 0.6468 | 2034 |
| 24 | 0.6217 | 0.6279 | 0.6342 | 2035 |
| 25 | 0.6095 | 0.6156 | 0.6217 | 2036 |
| 26 | 0.5976 | 0.6035 | 0.6095 | 2037 |
| 27 | 0.5859 | 0.5917 | 0.5976 | 2038 |
| 28 | 0.5744 | 0.5801 | 0.5859 | 2039 |
| 29 | 0.5631 | 0.5687 | 0.5744 | 2040 |
| 30 | 0.5521 | 0.5576 | 0.5631 | 2041 |
| 31 | 0.5412 | 0.5466 | 0.5521 | 2042 |

Notes:

30-Year real discount rate 2.0%

Mid-year factor: 1.0100

Sources: Office of Management and Budget, OMB Circular A-94,
Appendix C; BAE Urban Economics, 2012.

Life Cycle Cost Analysis (LCCA) Spreadsheet

F. E. Warren, Cheyenne WY

**ESTCP SI 0931
LCCA Demonstration**

Historic Building 222 (loss of interior integrity)

Mission: General Administrative Office

Prepared by:
BAE Urban Economics, Inc.

December 2012

Table III-39: Life Cycle Cost Analysis Summary: FEW 222

| Project Alternative | Non Discounted Costs by Component | | | Total Costs | | |
|---|-----------------------------------|--------------|----------------|----------------|---------------|---------------|
| | Initial | Recurring | Residual Value | Non Discounted | Discounted - | Discounted - |
| | Investment | | | | No GHG Factor | w/GHG Factor |
| FEW 222-01: Sustainment-Status Quo | \$ 2,799,729 | \$ 6,052,421 | \$ - | \$ 8,852,150 | \$ 7,203,043 | \$ 7,444,412 |
| FEW 222-02: Demolition and New Construction | \$ 9,426,338 | \$ 5,239,738 | \$ (3,825,087) | \$ 10,840,989 | \$ 10,958,636 | \$ 11,195,962 |
| FEW 222-03: Modernization with HPS | \$ 7,623,391 | \$ 5,551,534 | \$ (3,225,178) | \$ 9,949,746 | \$ 9,756,497 | \$ 9,950,588 |
| FEW 222-04: Modernization with AT/FP | \$ 8,558,230 | \$ 5,553,184 | \$ (3,626,046) | \$ 10,485,368 | \$ 10,447,755 | \$ 10,656,506 |

Notes:

| | |
|--|----------|
| Study Period (years): | 30 |
| Real Discount Rate: | 2.00% |
| Average CO _{2e} Value/MT (undiscounted) | \$ 36.61 |
| Base Date: | 10/01/12 |

Sources: Preservation Associates; BAE Urban Economics, 2012.

Table III-40: Greenhouse Gas Valuation Summary: FEW 222

| Project Alternative | GHG Emissions by Scope (MT CO _{2e}) | | | | GHG Value | |
|---|---|----------|----------|----------|------------|------------|
| | Scope 1 | Scope 2 | Scope 3 | Total | Non | Discounted |
| | | | | | Discounted | Discounted |
| FEW 222-01: Sustainment-Status Quo | 10.13 | 8,950.99 | 349.07 | 9,310.19 | \$ 340,880 | \$ 241,369 |
| FEW 222-02: Demolition and New Construction | 5.03 | 6,120.65 | 2,319.78 | 8,445.46 | \$ 309,102 | \$ 237,326 |
| FEW 222-03: Modernization with HPS | 3.17 | 6,062.94 | 1,069.66 | 7,135.77 | \$ 264,763 | \$ 194,091 |
| FEW 222-04: Modernization with AT/FP | 5.59 | 6,072.45 | 1,445.60 | 7,523.64 | \$ 276,540 | \$ 208,752 |

Notes:

| | |
|--|----------|
| Study Period (years): | 30 |
| Real Discount Rate: | 2.00% |
| Average CO _{2e} Value/MT (undiscounted) | \$ 36.61 |
| Base Date: | 10/01/12 |

Sources: Center for Resource Solutions; BAE Urban Economics, 2012.

Table 3: Alternatives Summary: FEW 222

| Project Alternative | Building GSF | | Building Features | | Construction Cost | |
|---|---------------------|------------------|--------------------------|--------------|--------------------------|---------------|
| | Total | Footprint | LEED | AT/FP | Total | Per SF |
| FEW 222-01: Sustainment-Status Quo | 32,526 | 10,842 | n/a | No | \$ 2,799,729 | \$ 86 |
| FEW 222-02: Demolition and New Construction | 30,200 | 10,920 | 51 | Yes | \$ 9,426,338 | \$ 312 |
| FEW 222-03: Modernization with HPS | 32,526 | 10,842 | 53 | Yes | \$ 7,623,391 | \$ 234 |
| FEW 222-04: Modernization with AT/FP | 32,526 | 10,842 | 53 | Yes+ | \$ 8,558,230 | \$ 263 |

Note:

Table 4: Construction Cost Summary: FEW 222

| Cost estimate | | | | |
|---------------------------------|-----------------------------------|---|----------------------------------|------------------------------------|
| Category | 01. Sustainment- Status Quo | Demolition and New Constructio n | 03. Modernization with HPS | 04. Modernization with AT/FP |
| Demolition | \$ 584,365 | \$ 1,334,808 | \$ 800,898 | \$ 887,748 |
| Services | \$ 227,144 | \$ 2,308,390 | \$ 2,572,655 | \$ 2,536,472 |
| Other Costs | \$ 1,318,498 | \$ 3,500,607 | \$ 2,480,203 | \$ 3,048,837 |
| Hard cost subtotal | \$ 2,130,006 | \$ 7,143,805 | \$ 5,853,755 | \$ 6,473,057 |
| General conditions (25%) | \$ 409,617 | \$ 1,451,993 | \$ 1,125,722 | \$ 1,326,446 |
| Security escalation (2%) | \$ 40,962 | \$ 116,159 | \$ 90,058 | \$ 106,116 |
| USACE design (6.6%) | \$ 102,404 | \$ 383,326 | \$ 297,191 | \$ 350,182 |
| USACE SOIH (5.7%) | \$ 116,741 | \$ 331,054 | \$ 256,665 | \$ 302,430 |
| Soft cost subtotal | \$ 669,723 | \$ 2,282,533 | \$ 1,769,635 | \$ 2,085,173 |
| Construction cost total | \$ 2,799,729 | \$ 9,426,338 | \$ 7,623,391 | \$ 8,558,230 |
| Construction Cost per SF | \$ 86 | \$ 312 | \$ 234 | \$ 263 |
| % Difference from 02 | -70% | N/A | -19% | -9% |

Sources: Preservation Associates; BAE Urban Economics Inc. 2012.

Table 5: NPV Calculation FEW 222-01: Sustainment-Status Quo

| Mid Year | One Time | | | | | | Recurring | | | Residual Value | | Net Present Value | | | | |
|----------|------------------|--------------|----------------------|------------|------------|------------------|---------------------------|--------------|---------------------|----------------|----------|-------------------|------------------|------------|--------------|--------------|
| | New Construction | Sustainment | Temporary Facilities | Relocation | Demo | Site Preparation | Environmental Remediation | Utilities | Repairs Maintenance | Other s | Building | Land | Undiscounted Sum | NPV Factor | Mid-Year | Cum NPV |
| 2012 | \$ - | \$ - | \$ - | \$ - | \$ 584,365 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 584,365 | 0.99 | \$ 578,607 | \$ 578,607 |
| 2013 | \$ - | \$ 2,215,365 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 58,384 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 2,417,112 | 0.97 | \$ 2,346,370 | \$ 2,924,977 |
| 2014 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 58,384 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 201,747 | 0.95 | \$ 192,003 | \$ 3,116,980 |
| 2015 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 58,384 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 201,747 | 0.93 | \$ 188,238 | \$ 3,305,218 |
| 2016 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 58,384 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 201,747 | 0.91 | \$ 184,547 | \$ 3,489,765 |
| 2017 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 58,384 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 201,747 | 0.90 | \$ 180,928 | \$ 3,670,694 |
| 2018 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 58,384 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 201,747 | 0.88 | \$ 177,381 | \$ 3,848,075 |
| 2019 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 58,384 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 201,747 | 0.86 | \$ 173,903 | \$ 4,021,977 |
| 2020 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 58,384 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 201,747 | 0.85 | \$ 170,493 | \$ 4,192,470 |
| 2021 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 58,384 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 201,747 | 0.83 | \$ 167,150 | \$ 4,359,620 |
| 2022 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 58,384 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 201,747 | 0.81 | \$ 163,872 | \$ 4,523,493 |
| 2023 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 58,384 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 201,747 | 0.80 | \$ 160,659 | \$ 4,684,152 |
| 2024 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 58,384 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 201,747 | 0.78 | \$ 157,509 | \$ 4,841,661 |
| 2025 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 58,384 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 201,747 | 0.77 | \$ 154,421 | \$ 4,996,082 |
| 2026 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 58,384 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 201,747 | 0.75 | \$ 151,393 | \$ 5,147,475 |
| 2027 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 58,384 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 201,747 | 0.74 | \$ 148,424 | \$ 5,295,899 |
| 2028 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 58,384 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 201,747 | 0.72 | \$ 145,514 | \$ 5,441,413 |
| 2029 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 58,384 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 201,747 | 0.71 | \$ 142,661 | \$ 5,584,074 |
| 2030 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 58,384 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 201,747 | 0.69 | \$ 139,864 | \$ 5,723,938 |
| 2031 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 58,384 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 201,747 | 0.68 | \$ 137,121 | \$ 5,861,059 |
| 2032 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 58,384 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 201,747 | 0.67 | \$ 134,433 | \$ 5,995,491 |
| 2033 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 58,384 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 201,747 | 0.65 | \$ 131,797 | \$ 6,127,288 |
| 2034 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 58,384 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 201,747 | 0.64 | \$ 129,212 | \$ 6,256,500 |
| 2035 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 58,384 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 201,747 | 0.63 | \$ 126,679 | \$ 6,383,179 |
| 2036 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 58,384 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 201,747 | 0.62 | \$ 124,195 | \$ 6,507,374 |
| 2037 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 58,384 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 201,747 | 0.60 | \$ 121,760 | \$ 6,629,134 |
| 2038 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 58,384 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 201,747 | 0.59 | \$ 119,372 | \$ 6,748,506 |
| 2039 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 58,384 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 201,747 | 0.58 | \$ 117,032 | \$ 6,865,537 |
| 2040 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 58,384 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 201,747 | 0.57 | \$ 114,737 | \$ 6,980,274 |
| 2041 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 58,384 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 201,747 | 0.56 | \$ 112,487 | \$ 7,092,761 |
| 2042 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 58,384 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 201,747 | 0.55 | \$ 110,281 | \$ 7,203,043 |
| TOTALS | \$ - | \$ 2,215,365 | \$ - | \$ - | \$ 584,365 | \$ - | \$ - | \$ 1,751,524 | \$ 1,304,207 | ##### | \$ - | \$ - | \$ 8,852,150 | | \$ 7,203,043 | \$ 7,203,043 |

Notes:

Project Alternative Summary

| | |
|--------------------|--------------|
| Capital Costs | \$ 2,799,729 |
| Recurring Costs | \$ 6,052,421 |
| Residual Value | \$ - |
| Non Discounted Sum | \$ 8,852,150 |
| Cum NPV | \$ 7,203,043 |

Key Assumptions:

| | | | |
|-----------------------------|------------------|---------------------------------|--|
| Discount Rate | 2.00% | Repairs and Maintenance | \$ 1.34 |
| Study Period | 30 years | Other Operations | \$ 3.07 |
| BaseYear | 2012 | Cleaning per sq. ft. | \$ 1.34 |
| Report Output | Constant Dollars | Roads and Grounds | \$ 0.67 |
| Cost per sq. ft. | \$68 | Administrative | \$ 1.06 |
| Construction Period (years) | 1 | BOMA Expense CPI Adjustmen | 2.03% |
| Building Size (sq. ft.) | 32,526 | Effective utilities per sq. ft. | \$ 1.79 Not from BOMA; calculated based on treatment specific energy usage |

Source: BAE Urban Economics, 2012.

Table 6: Schedule of Recurring Expenditures FEW 222-01 Sustainment-Status Quo

| Year | Total Annual Expenditures | Electrical | | | Natural Gas | | | Water/Sewer (a) | | | | | |
|------|---------------------------|------------|---------|----------|-------------|-------|----------|-----------------|-------|---------|-------|---------|-------|
| | | Total Cost | kWh | \$/kWh | Total Cost | MMBtu | \$/MMBtu | Total Cost | Water | \$/Kgal | Waste | \$/Kgal | Other |
| 2012 | \$ 58,384 | \$ 51,747 | 877,067 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2013 | \$ 58,384 | \$ 51,747 | 877,067 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2014 | \$ 58,384 | \$ 51,747 | 877,067 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2015 | \$ 58,384 | \$ 51,747 | 877,067 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2016 | \$ 58,384 | \$ 51,747 | 877,067 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2017 | \$ 58,384 | \$ 51,747 | 877,067 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2018 | \$ 58,384 | \$ 51,747 | 877,067 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2019 | \$ 58,384 | \$ 51,747 | 877,067 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2020 | \$ 58,384 | \$ 51,747 | 877,067 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2021 | \$ 58,384 | \$ 51,747 | 877,067 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2022 | \$ 58,384 | \$ 51,747 | 877,067 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2023 | \$ 58,384 | \$ 51,747 | 877,067 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2024 | \$ 58,384 | \$ 51,747 | 877,067 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2025 | \$ 58,384 | \$ 51,747 | 877,067 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2026 | \$ 58,384 | \$ 51,747 | 877,067 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2027 | \$ 58,384 | \$ 51,747 | 877,067 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2028 | \$ 58,384 | \$ 51,747 | 877,067 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2029 | \$ 58,384 | \$ 51,747 | 877,067 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2030 | \$ 58,384 | \$ 51,747 | 877,067 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2031 | \$ 58,384 | \$ 51,747 | 877,067 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2032 | \$ 58,384 | \$ 51,747 | 877,067 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2033 | \$ 58,384 | \$ 51,747 | 877,067 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2034 | \$ 58,384 | \$ 51,747 | 877,067 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2035 | \$ 58,384 | \$ 51,747 | 877,067 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2036 | \$ 58,384 | \$ 51,747 | 877,067 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2037 | \$ 58,384 | \$ 51,747 | 877,067 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2038 | \$ 58,384 | \$ 51,747 | 877,067 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2039 | \$ 58,384 | \$ 51,747 | 877,067 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2040 | \$ 58,384 | \$ 51,747 | 877,067 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2041 | \$ 58,384 | \$ 51,747 | 877,067 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2042 | \$ 58,384 | \$ 51,747 | 877,067 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |

Notes:

- (a) Water and sewer combined and calculated on square foot basis based upon BOMA ERR data.
 - CPI adjustment factor: 2.03% bring 2011 BOMA ERR data to 2012 dollars.
 - Water/sewer utility expense \$0.20 per sq. ft.
 - Building total sq. ft. 32,526

Source: BAE Urban Economics, 2012.

**Table 7: Depreciation Schedule & Residual Value: FEW
222-01 Demolition and New Construction**

| Period | Depreciation Schedule | Residual Value |
|---------------|----------------------------------|---------------------------|
| 2012 | \$ - | \$ - |
| 2013 | \$ 2,215,365 | \$ - |
| 2014 | \$ 2,104,597 | \$ - |
| 2015 | \$ 1,993,828 | \$ - |
| 2016 | \$ 1,883,060 | \$ - |
| 2017 | \$ 1,772,292 | \$ - |
| 2018 | \$ 1,661,524 | \$ - |
| 2019 | \$ 1,550,755 | \$ - |
| 2020 | \$ 1,439,987 | \$ - |
| 2021 | \$ 1,329,219 | \$ - |
| 2022 | \$ 1,218,451 | \$ - |
| 2023 | \$ 1,107,682 | \$ - |
| 2024 | \$ 996,914 | \$ - |
| 2025 | \$ 886,146 | \$ - |
| 2026 | \$ 775,378 | \$ - |
| 2027 | \$ 664,609 | \$ - |
| 2028 | \$ 553,841 | \$ - |
| 2029 | \$ 443,073 | \$ - |
| 2030 | \$ 332,305 | \$ - |
| 2031 | \$ 221,536 | \$ - |
| 2032 | \$ 110,768 | \$ - |
| 2033 | \$ - | \$ - |
| 2034 | \$ - | \$ - |
| 2035 | \$ - | \$ - |
| 2036 | \$ - | \$ - |
| 2037 | \$ - | \$ - |
| 2038 | \$ - | \$ - |
| 2039 | \$ - | \$ - |
| 2040 | \$ - | \$ - |
| 2041 | \$ - | \$ - |
| 2042 | \$ - | \$ - |

NOTE:

Useful life of asset: 20.0 years

Source: BAE Urban Economics, Inc. 2012.

Table 8: NPV Calculation FEW 222-02: Demolition and New Construction

| Mid Year | One Time | | | | | | | | Recurring | | | Residual Value | | Net Present Value | | |
|---------------|---------------------|--------------|----------------------|-------------|---------------------|------------------|---------------------------|---------------------|---------------------|---------------------|-----------------------|----------------|----------------------|-------------------|----------------------|----------------------|
| | New Construction | Major Repair | Temporary Facilities | Relocation | Demo | Site Preparation | Environmental Remediation | Utilities | Repairs Maintenance | Other Operations | Building | Land | Undiscounted Sum | NPV Factor | Mid-Year | Cum NPV |
| 2012 | \$ - | \$ - | \$ - | \$ - | \$ 1,334,808 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 1,334,808 | 0.99 | \$ 1,321,656 | \$ 1,321,656 |
| 2013 | \$ 8,091,531 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,547 | \$ 40,365 | \$ 92,746 | \$ - | \$ - | \$ 8,266,188 | 0.97 | \$ 8,024,261 | \$ 9,345,917 |
| 2014 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,547 | \$ 40,365 | \$ 92,746 | \$ - | \$ - | \$ 174,658 | 0.95 | \$ 166,222 | \$ 9,512,139 |
| 2015 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,547 | \$ 40,365 | \$ 92,746 | \$ - | \$ - | \$ 174,658 | 0.93 | \$ 162,963 | \$ 9,675,102 |
| 2016 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,547 | \$ 40,365 | \$ 92,746 | \$ - | \$ - | \$ 174,658 | 0.91 | \$ 159,767 | \$ 9,834,869 |
| 2017 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,547 | \$ 40,365 | \$ 92,746 | \$ - | \$ - | \$ 174,658 | 0.90 | \$ 156,634 | \$ 9,991,503 |
| 2018 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,547 | \$ 40,365 | \$ 92,746 | \$ - | \$ - | \$ 174,658 | 0.88 | \$ 153,563 | \$ 10,145,067 |
| 2019 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,547 | \$ 40,365 | \$ 92,746 | \$ - | \$ - | \$ 174,658 | 0.86 | \$ 150,552 | \$ 10,295,619 |
| 2020 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,547 | \$ 40,365 | \$ 92,746 | \$ - | \$ - | \$ 174,658 | 0.85 | \$ 147,600 | \$ 10,443,219 |
| 2021 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,547 | \$ 40,365 | \$ 92,746 | \$ - | \$ - | \$ 174,658 | 0.83 | \$ 144,706 | \$ 10,587,925 |
| 2022 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,547 | \$ 40,365 | \$ 92,746 | \$ - | \$ - | \$ 174,658 | 0.81 | \$ 141,869 | \$ 10,729,794 |
| 2023 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,547 | \$ 40,365 | \$ 92,746 | \$ - | \$ - | \$ 174,658 | 0.80 | \$ 139,087 | \$ 10,868,881 |
| 2024 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,547 | \$ 40,365 | \$ 92,746 | \$ - | \$ - | \$ 174,658 | 0.78 | \$ 136,360 | \$ 11,005,240 |
| 2025 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,547 | \$ 40,365 | \$ 92,746 | \$ - | \$ - | \$ 174,658 | 0.77 | \$ 133,686 | \$ 11,138,926 |
| 2026 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,547 | \$ 40,365 | \$ 92,746 | \$ - | \$ - | \$ 174,658 | 0.75 | \$ 131,065 | \$ 11,269,991 |
| 2027 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,547 | \$ 40,365 | \$ 92,746 | \$ - | \$ - | \$ 174,658 | 0.74 | \$ 128,495 | \$ 11,398,486 |
| 2028 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,547 | \$ 40,365 | \$ 92,746 | \$ - | \$ - | \$ 174,658 | 0.72 | \$ 125,975 | \$ 11,524,461 |
| 2029 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,547 | \$ 40,365 | \$ 92,746 | \$ - | \$ - | \$ 174,658 | 0.71 | \$ 123,505 | \$ 11,647,967 |
| 2030 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,547 | \$ 40,365 | \$ 92,746 | \$ - | \$ - | \$ 174,658 | 0.69 | \$ 121,084 | \$ 11,769,050 |
| 2031 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,547 | \$ 40,365 | \$ 92,746 | \$ - | \$ - | \$ 174,658 | 0.68 | \$ 118,709 | \$ 11,887,760 |
| 2032 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,547 | \$ 40,365 | \$ 92,746 | \$ - | \$ - | \$ 174,658 | 0.67 | \$ 116,382 | \$ 12,004,141 |
| 2033 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,547 | \$ 40,365 | \$ 92,746 | \$ - | \$ - | \$ 174,658 | 0.65 | \$ 114,100 | \$ 12,118,241 |
| 2034 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,547 | \$ 40,365 | \$ 92,746 | \$ - | \$ - | \$ 174,658 | 0.64 | \$ 111,862 | \$ 12,230,104 |
| 2035 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,547 | \$ 40,365 | \$ 92,746 | \$ - | \$ - | \$ 174,658 | 0.63 | \$ 109,669 | \$ 12,339,773 |
| 2036 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,547 | \$ 40,365 | \$ 92,746 | \$ - | \$ - | \$ 174,658 | 0.62 | \$ 107,519 | \$ 12,447,291 |
| 2037 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,547 | \$ 40,365 | \$ 92,746 | \$ - | \$ - | \$ 174,658 | 0.60 | \$ 105,411 | \$ 12,552,702 |
| 2038 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,547 | \$ 40,365 | \$ 92,746 | \$ - | \$ - | \$ 174,658 | 0.59 | \$ 103,344 | \$ 12,656,046 |
| 2039 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,547 | \$ 40,365 | \$ 92,746 | \$ - | \$ - | \$ 174,658 | 0.58 | \$ 101,317 | \$ 12,757,363 |
| 2040 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,547 | \$ 40,365 | \$ 92,746 | \$ - | \$ - | \$ 174,658 | 0.57 | \$ 99,331 | \$ 12,856,694 |
| 2041 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,547 | \$ 40,365 | \$ 92,746 | \$ - | \$ - | \$ 174,658 | 0.56 | \$ 97,383 | \$ 12,954,077 |
| 2042 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,547 | \$ 40,365 | \$ 92,746 | \$ (3,825,087) | \$ - | \$ (3,650,429) | 0.55 | \$ (1,995,440) | \$ 10,958,636 |
| TOTALS | \$ 8,091,531 | \$ - | \$ - | \$ - | \$ 1,334,808 | \$ - | \$ - | \$ 1,246,407 | \$ 1,210,941 | \$ 2,782,390 | \$ (3,825,087) | \$ - | \$ 10,840,989 | | \$ 10,958,636 | \$ 10,958,636 |

Notes:

Project Alternative Summary

| | |
|--------------------|----------------|
| Capital Costs | \$ 9,426,338 |
| Recurring Costs | \$ 5,239,738 |
| Residual Value | \$ (3,825,087) |
| Non Discounted Sum | \$ 10,840,989 |
| Cum NPV | \$ 10,958,636 |

Key Assumptions:

| | | | |
|-----------------------------|------------------|---------------------------------|--|
| Discount Rate | 2.00% | Repairs and Maintenance | \$ 1.34 |
| Study Period | 30 years | Other Operations | \$ 3.07 |
| Base Year | 2012 | Cleaning per sq. ft. | \$ 1.34 |
| Report Output | Constant Dollars | Roads and Grounds | \$ 0.67 |
| Cost per sq. ft. | \$ 0 | Administrative | \$ 1.06 |
| Construction Period (years) | 1 | BOMA Expense CPI Adjustment | 2.03% |
| Building Size (sq. ft.) | 30,200 | Effective utilities per sq. ft. | \$ 1.38 Not from BOMA; calculated based on treatment specific energy usage |

Source: BAE Urban Economics, 2012.

Table 9: Schedule of Recurring Expenditures FEW 222-02 Demolition and New Construction

| Year | Total Annual Expenditures | Electrical | | | Natural Gas | | | Water/Sewer (a) | | | | | |
|------|---------------------------|------------|---------|----------|-------------|-------|----------|-----------------|-------|---------|-------|---------|-------|
| | | Total Cost | kWh | \$/kWh | Total Cost | MMBtu | \$/MMBtu | Total Cost | Water | \$/Kgal | Waste | \$/Kgal | Other |
| 2012 | \$ 41,547 | \$ 35,384 | 599,735 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,163 | | | | | \$ - |
| 2013 | \$ 41,547 | \$ 35,384 | 599,735 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,163 | | | | | \$ - |
| 2014 | \$ 41,547 | \$ 35,384 | 599,735 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,163 | | | | | \$ - |
| 2015 | \$ 41,547 | \$ 35,384 | 599,735 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,163 | | | | | \$ - |
| 2016 | \$ 41,547 | \$ 35,384 | 599,735 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,163 | | | | | \$ - |
| 2017 | \$ 41,547 | \$ 35,384 | 599,735 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,163 | | | | | \$ - |
| 2018 | \$ 41,547 | \$ 35,384 | 599,735 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,163 | | | | | \$ - |
| 2019 | \$ 41,547 | \$ 35,384 | 599,735 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,163 | | | | | \$ - |
| 2020 | \$ 41,547 | \$ 35,384 | 599,735 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,163 | | | | | \$ - |
| 2021 | \$ 41,547 | \$ 35,384 | 599,735 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,163 | | | | | \$ - |
| 2022 | \$ 41,547 | \$ 35,384 | 599,735 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,163 | | | | | \$ - |
| 2023 | \$ 41,547 | \$ 35,384 | 599,735 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,163 | | | | | \$ - |
| 2024 | \$ 41,547 | \$ 35,384 | 599,735 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,163 | | | | | \$ - |
| 2025 | \$ 41,547 | \$ 35,384 | 599,735 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,163 | | | | | \$ - |
| 2026 | \$ 41,547 | \$ 35,384 | 599,735 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,163 | | | | | \$ - |
| 2027 | \$ 41,547 | \$ 35,384 | 599,735 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,163 | | | | | \$ - |
| 2028 | \$ 41,547 | \$ 35,384 | 599,735 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,163 | | | | | \$ - |
| 2029 | \$ 41,547 | \$ 35,384 | 599,735 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,163 | | | | | \$ - |
| 2030 | \$ 41,547 | \$ 35,384 | 599,735 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,163 | | | | | \$ - |
| 2031 | \$ 41,547 | \$ 35,384 | 599,735 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,163 | | | | | \$ - |
| 2032 | \$ 41,547 | \$ 35,384 | 599,735 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,163 | | | | | \$ - |
| 2033 | \$ 41,547 | \$ 35,384 | 599,735 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,163 | | | | | \$ - |
| 2034 | \$ 41,547 | \$ 35,384 | 599,735 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,163 | | | | | \$ - |
| 2035 | \$ 41,547 | \$ 35,384 | 599,735 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,163 | | | | | \$ - |
| 2036 | \$ 41,547 | \$ 35,384 | 599,735 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,163 | | | | | \$ - |
| 2037 | \$ 41,547 | \$ 35,384 | 599,735 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,163 | | | | | \$ - |
| 2038 | \$ 41,547 | \$ 35,384 | 599,735 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,163 | | | | | \$ - |
| 2039 | \$ 41,547 | \$ 35,384 | 599,735 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,163 | | | | | \$ - |
| 2040 | \$ 41,547 | \$ 35,384 | 599,735 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,163 | | | | | \$ - |
| 2041 | \$ 41,547 | \$ 35,384 | 599,735 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,163 | | | | | \$ - |
| 2042 | \$ 41,547 | \$ 35,384 | 599,735 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,163 | | | | | \$ - |

Notes:

- (a) Water and sewer combined and calculated on square foot basis based upon BOMA ERR data.
- CPI adjustment factor: 2.03% bring 2011 BOMA ERR data to 2012 dollars.
- Water/sewer utility expense \$0.20 per sq. ft.
- Building total sq. ft. 30,200

Source: BAE Urban Economics, 2012.

**Table 10: Depreciation Schedule & Residual Value:
FEW 222-02 Demolition and New Construction**

| Period | Depreciation Schedule | Residual Value |
|---------------|----------------------------------|---------------------------|
| 2012 | \$ - | \$ - |
| 2013 | \$ 8,091,531 | \$ - |
| 2014 | \$ 7,944,412 | \$ - |
| 2015 | \$ 7,797,293 | \$ - |
| 2016 | \$ 7,650,174 | \$ - |
| 2017 | \$ 7,503,056 | \$ - |
| 2018 | \$ 7,355,937 | \$ - |
| 2019 | \$ 7,208,818 | \$ - |
| 2020 | \$ 7,061,699 | \$ - |
| 2021 | \$ 6,914,581 | \$ - |
| 2022 | \$ 6,767,462 | \$ - |
| 2023 | \$ 6,620,343 | \$ - |
| 2024 | \$ 6,473,224 | \$ - |
| 2025 | \$ 6,326,106 | \$ - |
| 2026 | \$ 6,178,987 | \$ - |
| 2027 | \$ 6,031,868 | \$ - |
| 2028 | \$ 5,884,749 | \$ - |
| 2029 | \$ 5,737,631 | \$ - |
| 2030 | \$ 5,590,512 | \$ - |
| 2031 | \$ 5,443,393 | \$ - |
| 2032 | \$ 5,296,275 | \$ - |
| 2033 | \$ 5,149,156 | \$ - |
| 2034 | \$ 5,002,037 | \$ - |
| 2035 | \$ 4,854,918 | \$ - |
| 2036 | \$ 4,707,800 | \$ - |
| 2037 | \$ 4,560,681 | \$ - |
| 2038 | \$ 4,413,562 | \$ - |
| 2039 | \$ 4,266,443 | \$ - |
| 2040 | \$ 4,119,325 | \$ - |
| 2041 | \$ 3,972,206 | \$ - |
| 2042 | \$ 3,825,087 | \$ 3,825,087 |

NOTE:

Useful life of asset: 55.0 years

Source: BAE Urban Economics, Inc. 2012.

Table 11: NPV Calculation FEW 222-03: Modernization with HPS

| Mid Year | One Time | | | | | | | Recurring | | | Residual Value | | Net Present Value | | | |
|----------|------------------|---------------|----------------------|------------|------------|------------------|---------------------------|--------------|---------------------|------------------|----------------|------|-------------------|------------|----------------|---------------|
| | New Construction | Modernization | Temporary Facilities | Relocation | Demo | Site Preparation | Environmental Remediation | Utilities | Repairs Maintenance | Other Operations | Building | Land | Undiscounted Sum | NPV Factor | Mid-Year | Cum NPV |
| 2012 | \$ - | \$ - | \$ - | \$ - | \$ 800,898 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 800,898 | 0.99 | \$ 793,007 | \$ 793,007 |
| 2013 | \$ - | \$ 6,822,493 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,688 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 7,007,544 | 0.97 | \$ 6,802,454 | \$ 7,595,460 |
| 2014 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,688 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,051 | 0.95 | \$ 176,113 | \$ 7,771,573 |
| 2015 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,688 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,051 | 0.93 | \$ 172,660 | \$ 7,944,233 |
| 2016 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,688 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,051 | 0.91 | \$ 169,274 | \$ 8,113,507 |
| 2017 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,688 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,051 | 0.90 | \$ 165,955 | \$ 8,279,463 |
| 2018 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,688 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,051 | 0.88 | \$ 162,701 | \$ 8,442,164 |
| 2019 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,688 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,051 | 0.86 | \$ 159,511 | \$ 8,601,675 |
| 2020 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,688 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,051 | 0.85 | \$ 156,383 | \$ 8,758,058 |
| 2021 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,688 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,051 | 0.83 | \$ 153,317 | \$ 8,911,375 |
| 2022 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,688 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,051 | 0.81 | \$ 150,311 | \$ 9,061,686 |
| 2023 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,688 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,051 | 0.80 | \$ 147,363 | \$ 9,209,049 |
| 2024 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,688 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,051 | 0.78 | \$ 144,474 | \$ 9,353,523 |
| 2025 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,688 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,051 | 0.77 | \$ 141,641 | \$ 9,495,164 |
| 2026 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,688 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,051 | 0.75 | \$ 138,864 | \$ 9,634,028 |
| 2027 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,688 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,051 | 0.74 | \$ 136,141 | \$ 9,770,169 |
| 2028 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,688 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,051 | 0.72 | \$ 133,472 | \$ 9,903,641 |
| 2029 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,688 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,051 | 0.71 | \$ 130,855 | \$ 10,034,495 |
| 2030 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,688 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,051 | 0.69 | \$ 128,289 | \$ 10,162,784 |
| 2031 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,688 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,051 | 0.68 | \$ 125,773 | \$ 10,288,557 |
| 2032 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,688 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,051 | 0.67 | \$ 123,307 | \$ 10,411,864 |
| 2033 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,688 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,051 | 0.65 | \$ 120,889 | \$ 10,532,754 |
| 2034 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,688 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,051 | 0.64 | \$ 118,519 | \$ 10,651,273 |
| 2035 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,688 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,051 | 0.63 | \$ 116,195 | \$ 10,767,468 |
| 2036 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,688 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,051 | 0.62 | \$ 113,917 | \$ 10,881,384 |
| 2037 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,688 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,051 | 0.60 | \$ 111,683 | \$ 10,993,068 |
| 2038 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,688 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,051 | 0.59 | \$ 109,493 | \$ 11,102,561 |
| 2039 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,688 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,051 | 0.58 | \$ 107,346 | \$ 11,209,907 |
| 2040 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,688 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,051 | 0.57 | \$ 105,241 | \$ 11,315,148 |
| 2041 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,688 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,051 | 0.56 | \$ 103,178 | \$ 11,418,326 |
| 2042 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,688 | \$ 43,474 | \$ 99,890 | \$ (3,225,178) | \$ - | \$ (3,040,127) | 0.55 | \$ (1,661,830) | \$ 9,756,497 |
| TOTALS | \$ - | \$ 6,822,493 | \$ - | \$ - | \$ 800,898 | \$ - | \$ - | \$ 1,250,637 | \$ 1,304,207 | \$ 2,996,690 | \$ (3,225,178) | \$ - | \$ 9,949,746 | | \$ 9,756,497 | \$ 9,756,497 |

Notes:

Project Alternative Summary

| | |
|--------------------|----------------|
| Capital Costs | \$ 7,623,391 |
| Recurring Costs | \$ 5,551,534 |
| Residual Value | \$ (3,225,178) |
| Non Discounted Sum | \$ 9,949,746 |
| Cum NPV | \$ 9,756,497 |

Key Assumptions:

| | | | |
|-----------------------------|------------------|---------------------------------|--|
| Discount Rate | 2.00% | Repairs and Maintenance | \$ 1.34 |
| Study Period | 30 years | Other Operations | \$ 3.07 |
| Base Year | 2012 | Cleaning per sq. ft. | \$ 1.34 |
| Report Output | Constant Dollars | Roads and Grounds | \$ 0.67 |
| Cost per sq. ft. | \$210 | Administrative | \$ 1.06 |
| Construction Period (years) | 1 | BOMA Expense CPI Adjustment | 2.03% |
| Building Size (sq. ft.) | 32,526 | Effective utilities per sq. ft. | \$ 1.28 Not from BOMA; calculated based on treatment specific energy usage |

Source: BAE Urban Economics, 2012.

Table 12: Schedule of Recurring Expenditures 222-03 Modernization with HPS

| Year | Total Annual Expenditures | Electrical | | | Natural Gas | | | Water/Sewer (a) | | | | Other | |
|------|---------------------------|------------|---------|----------|-------------|-------|----------|-----------------|-------|---------|-------|-------|---------|
| | | Total Cost | kWh | \$/kWh | Total Cost | MMBtu | \$/MMBtu | Total Cost | Water | \$/Kgal | Waste | | \$/Kgal |
| 2012 | \$ 41,688 | \$ 35,051 | 594,080 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2013 | \$ 41,688 | \$ 35,051 | 594,080 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2014 | \$ 41,688 | \$ 35,051 | 594,080 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2015 | \$ 41,688 | \$ 35,051 | 594,080 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2016 | \$ 41,688 | \$ 35,051 | 594,080 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2017 | \$ 41,688 | \$ 35,051 | 594,080 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2018 | \$ 41,688 | \$ 35,051 | 594,080 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2019 | \$ 41,688 | \$ 35,051 | 594,080 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2020 | \$ 41,688 | \$ 35,051 | 594,080 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2021 | \$ 41,688 | \$ 35,051 | 594,080 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2022 | \$ 41,688 | \$ 35,051 | 594,080 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2023 | \$ 41,688 | \$ 35,051 | 594,080 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2024 | \$ 41,688 | \$ 35,051 | 594,080 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2025 | \$ 41,688 | \$ 35,051 | 594,080 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2026 | \$ 41,688 | \$ 35,051 | 594,080 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2027 | \$ 41,688 | \$ 35,051 | 594,080 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2028 | \$ 41,688 | \$ 35,051 | 594,080 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2029 | \$ 41,688 | \$ 35,051 | 594,080 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2030 | \$ 41,688 | \$ 35,051 | 594,080 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2031 | \$ 41,688 | \$ 35,051 | 594,080 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2032 | \$ 41,688 | \$ 35,051 | 594,080 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2033 | \$ 41,688 | \$ 35,051 | 594,080 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2034 | \$ 41,688 | \$ 35,051 | 594,080 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2035 | \$ 41,688 | \$ 35,051 | 594,080 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2036 | \$ 41,688 | \$ 35,051 | 594,080 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2037 | \$ 41,688 | \$ 35,051 | 594,080 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2038 | \$ 41,688 | \$ 35,051 | 594,080 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2039 | \$ 41,688 | \$ 35,051 | 594,080 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2040 | \$ 41,688 | \$ 35,051 | 594,080 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2041 | \$ 41,688 | \$ 35,051 | 594,080 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2042 | \$ 41,688 | \$ 35,051 | 594,080 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |

Notes:

(a) Water and sewer combined and calculated on square foot basis based upon BOMA ERR data.

CPI adjustment factor: 2.03% bring 2011 BOMA ERR data to 2012 dollars.
 Water/sewer utility expense \$0.20 per sq. ft.
 Building total sq. ft. 32,526

Source: BAE Urban Economics, 2012.

**Table 13: Depreciation Schedule & Residual Value:
FEW 222-03 Modernization with HPS**

| Period | Depreciation Schedule | Residual Value |
|---------------|----------------------------------|---------------------------|
| 2012 | \$ - | \$ - |
| 2013 | \$ 6,822,493 | \$ - |
| 2014 | \$ 6,698,448 | \$ - |
| 2015 | \$ 6,574,402 | \$ - |
| 2016 | \$ 6,450,357 | \$ - |
| 2017 | \$ 6,326,312 | \$ - |
| 2018 | \$ 6,202,266 | \$ - |
| 2019 | \$ 6,078,221 | \$ - |
| 2020 | \$ 5,954,176 | \$ - |
| 2021 | \$ 5,830,130 | \$ - |
| 2022 | \$ 5,706,085 | \$ - |
| 2023 | \$ 5,582,040 | \$ - |
| 2024 | \$ 5,457,994 | \$ - |
| 2025 | \$ 5,333,949 | \$ - |
| 2026 | \$ 5,209,904 | \$ - |
| 2027 | \$ 5,085,858 | \$ - |
| 2028 | \$ 4,961,813 | \$ - |
| 2029 | \$ 4,837,768 | \$ - |
| 2030 | \$ 4,713,722 | \$ - |
| 2031 | \$ 4,589,677 | \$ - |
| 2032 | \$ 4,465,632 | \$ - |
| 2033 | \$ 4,341,586 | \$ - |
| 2034 | \$ 4,217,541 | \$ - |
| 2035 | \$ 4,093,496 | \$ - |
| 2036 | \$ 3,969,450 | \$ - |
| 2037 | \$ 3,845,405 | \$ - |
| 2038 | \$ 3,721,360 | \$ - |
| 2039 | \$ 3,597,314 | \$ - |
| 2040 | \$ 3,473,269 | \$ - |
| 2041 | \$ 3,349,224 | \$ - |
| 2042 | \$ 3,225,178 | \$ 3,225,178 |

NOTE:

Useful life of asset: 55.0 years

Source: BAE Urban Economics, Inc. 2012.

Table 14: NPV Calculation FEW 222-04 Modernization with AT/FP

| Mid e | One Time | | | | | | | Recurring | | | Residual Value | | Net Present Value | | | |
|-------|------------------|---------------|----------------------|------------|------------|------------------|---------------------------|--------------|---------------------|------------------|----------------|------|-------------------|------------|----------------|---------------|
| | New Construction | Modernization | Temporary Facilities | Relocation | Demo | Site Preparation | Environmental Remediation | Utilities | Repairs Maintenance | Other Operations | Building | Land | Undiscounted Sum | NPV Factor | Mid-Year | Cum NPV |
| # | \$ - | \$ - | \$ - | \$ - | \$ 887,748 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 887,748 | 0.99 | \$ 879,002 | \$ 879,002 |
| # | \$ - | \$ 7,670,482 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,743 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 7,855,588 | 0.97 | \$ 7,625,678 | \$ 8,504,679 |
| # | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,743 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,106 | 0.95 | \$ 176,165 | \$ 8,680,845 |
| # | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,743 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,106 | 0.93 | \$ 172,711 | \$ 8,853,556 |
| # | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,743 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,106 | 0.91 | \$ 169,325 | \$ 9,022,880 |
| # | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,743 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,106 | 0.90 | \$ 166,004 | \$ 9,188,885 |
| # | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,743 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,106 | 0.88 | \$ 162,749 | \$ 9,351,634 |
| # | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,743 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,106 | 0.86 | \$ 159,558 | \$ 9,511,193 |
| # | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,743 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,106 | 0.85 | \$ 156,430 | \$ 9,667,622 |
| # | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,743 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,106 | 0.83 | \$ 153,362 | \$ 9,820,985 |
| # | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,743 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,106 | 0.81 | \$ 150,355 | \$ 9,971,340 |
| # | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,743 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,106 | 0.80 | \$ 147,407 | \$ 10,118,747 |
| # | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,743 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,106 | 0.78 | \$ 144,517 | \$ 10,263,264 |
| # | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,743 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,106 | 0.77 | \$ 141,683 | \$ 10,404,948 |
| # | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,743 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,106 | 0.75 | \$ 138,905 | \$ 10,543,853 |
| # | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,743 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,106 | 0.74 | \$ 136,182 | \$ 10,680,034 |
| # | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,743 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,106 | 0.72 | \$ 133,511 | \$ 10,813,546 |
| # | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,743 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,106 | 0.71 | \$ 130,893 | \$ 10,944,439 |
| # | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,743 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,106 | 0.69 | \$ 128,327 | \$ 11,072,766 |
| # | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,743 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,106 | 0.68 | \$ 125,811 | \$ 11,198,576 |
| # | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,743 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,106 | 0.67 | \$ 123,344 | \$ 11,321,920 |
| # | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,743 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,106 | 0.65 | \$ 120,925 | \$ 11,442,845 |
| # | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,743 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,106 | 0.64 | \$ 118,554 | \$ 11,561,400 |
| # | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,743 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,106 | 0.63 | \$ 116,230 | \$ 11,677,629 |
| # | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,743 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,106 | 0.62 | \$ 113,951 | \$ 11,791,580 |
| # | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,743 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,106 | 0.60 | \$ 111,716 | \$ 11,903,296 |
| # | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,743 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,106 | 0.59 | \$ 109,526 | \$ 12,012,822 |
| # | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,743 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,106 | 0.58 | \$ 107,378 | \$ 12,120,200 |
| # | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,743 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,106 | 0.57 | \$ 105,273 | \$ 12,225,473 |
| # | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,743 | \$ 43,474 | \$ 99,890 | \$ - | \$ - | \$ 185,106 | 0.56 | \$ 103,209 | \$ 12,328,681 |
| # | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 41,743 | \$ 43,474 | \$ 99,890 | \$ (3,626,046) | \$ - | \$ (3,440,940) | 0.55 | \$ (1,880,927) | \$ 10,447,755 |
| TOT. | \$ - | \$ 7,670,482 | \$ - | \$ - | \$ 887,748 | \$ - | \$ - | \$ 1,252,287 | \$ 1,304,207 | \$ 2,996,690 | \$ (3,626,046) | \$ - | \$ 10,485,368 | | \$ 10,447,755 | \$ 10,447,755 |

Notes:

Project Alternative Summary

| | |
|--------------------|----------------|
| Capital Costs | \$ 8,558,230 |
| Recurring Costs | \$ 5,553,184 |
| Residual Value | \$ (3,626,046) |
| Non Discounted Sum | \$ 10,485,368 |
| Cum NPV | \$ 10,447,755 |

Key Assumptions:

| | | | |
|-----------------------------|------------------|---------------------------------|--|
| Discount Rate | 2.00% | Repairs and Maintenance | \$ 1.34 |
| Study Period | 30 years | Other Operations | \$ 3.07 |
| Base Year | 2012 | Cleaning per sq. ft. | \$ 1.34 |
| Report Output | Constant Dollars | Roads and Grounds | \$ 0.67 |
| Cost per sq. ft. | \$236 | Administrative | \$ 1.06 |
| Construction Period (years) | 1 | BOMA Expense CPI Adjustment | 2.03% |
| Building Size (sq. ft.) | 32,526 | Effective utilities per sq. ft. | \$ 1.28 Not from BOMA; calculated based on treatment specific energy usage |

Source: BAE Urban Economics, 2012.

Table 15: Schedule of Recurring Expenditures FEW 222-04 Modernization with AT/FP

| Year | Total Annual Expenditures | Electrical | | | Natural Gas | | | Water/Sewer (a) | | | | | |
|------|---------------------------|------------|---------|----------|-------------|-------|----------|-----------------|-------|---------|-------|---------|-------|
| | | Total Cost | kWh | \$/kWh | Total Cost | MMBtu | \$/MMBtu | Total Cost | Water | \$/Kgal | Waste | \$/Kgal | Other |
| 2012 | \$ 41,743 | \$ 35,106 | 595,012 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2013 | \$ 41,743 | \$ 35,106 | 595,012 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2014 | \$ 41,743 | \$ 35,106 | 595,012 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2015 | \$ 41,743 | \$ 35,106 | 595,012 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2016 | \$ 41,743 | \$ 35,106 | 595,012 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2017 | \$ 41,743 | \$ 35,106 | 595,012 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2018 | \$ 41,743 | \$ 35,106 | 595,012 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2019 | \$ 41,743 | \$ 35,106 | 595,012 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2020 | \$ 41,743 | \$ 35,106 | 595,012 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2021 | \$ 41,743 | \$ 35,106 | 595,012 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2022 | \$ 41,743 | \$ 35,106 | 595,012 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2023 | \$ 41,743 | \$ 35,106 | 595,012 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2024 | \$ 41,743 | \$ 35,106 | 595,012 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2025 | \$ 41,743 | \$ 35,106 | 595,012 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2026 | \$ 41,743 | \$ 35,106 | 595,012 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2027 | \$ 41,743 | \$ 35,106 | 595,012 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2028 | \$ 41,743 | \$ 35,106 | 595,012 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2029 | \$ 41,743 | \$ 35,106 | 595,012 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2030 | \$ 41,743 | \$ 35,106 | 595,012 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2031 | \$ 41,743 | \$ 35,106 | 595,012 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2032 | \$ 41,743 | \$ 35,106 | 595,012 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2033 | \$ 41,743 | \$ 35,106 | 595,012 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2034 | \$ 41,743 | \$ 35,106 | 595,012 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2035 | \$ 41,743 | \$ 35,106 | 595,012 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2036 | \$ 41,743 | \$ 35,106 | 595,012 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2037 | \$ 41,743 | \$ 35,106 | 595,012 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2038 | \$ 41,743 | \$ 35,106 | 595,012 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2039 | \$ 41,743 | \$ 35,106 | 595,012 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2040 | \$ 41,743 | \$ 35,106 | 595,012 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2041 | \$ 41,743 | \$ 35,106 | 595,012 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |
| 2042 | \$ 41,743 | \$ 35,106 | 595,012 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 6,637 | | | | | \$ - |

Notes:

- (a) Water and sewer combined and calculated on square foot basis based upon BOMA ERR data.
 - CPI adjustment factor: 2.03% bring 2011 BOMA ERR data to 2012 dollars.
 - Water/sewer utility expense \$0.20 per sq. ft.
 - Building total sq. ft. 32,526

Source: BAE Urban Economics, 2012.

**Table 16: Depreciation Schedule & Residual Value:
FEW 222-04 Modernization with AT/FP**

| Period | Depreciation Schedule | Residual Value |
|---------------|----------------------------------|---------------------------|
| 2012 | \$ - | \$ - |
| 2013 | \$ 7,670,482 | \$ - |
| 2014 | \$ 7,531,019 | \$ - |
| 2015 | \$ 7,391,556 | \$ - |
| 2016 | \$ 7,252,092 | \$ - |
| 2017 | \$ 7,112,629 | \$ - |
| 2018 | \$ 6,973,166 | \$ - |
| 2019 | \$ 6,833,702 | \$ - |
| 2020 | \$ 6,694,239 | \$ - |
| 2021 | \$ 6,554,776 | \$ - |
| 2022 | \$ 6,415,312 | \$ - |
| 2023 | \$ 6,275,849 | \$ - |
| 2024 | \$ 6,136,386 | \$ - |
| 2025 | \$ 5,996,922 | \$ - |
| 2026 | \$ 5,857,459 | \$ - |
| 2027 | \$ 5,717,996 | \$ - |
| 2028 | \$ 5,578,532 | \$ - |
| 2029 | \$ 5,439,069 | \$ - |
| 2030 | \$ 5,299,606 | \$ - |
| 2031 | \$ 5,160,143 | \$ - |
| 2032 | \$ 5,020,679 | \$ - |
| 2033 | \$ 4,881,216 | \$ - |
| 2034 | \$ 4,741,753 | \$ - |
| 2035 | \$ 4,602,289 | \$ - |
| 2036 | \$ 4,462,826 | \$ - |
| 2037 | \$ 4,323,363 | \$ - |
| 2038 | \$ 4,183,899 | \$ - |
| 2039 | \$ 4,044,436 | \$ - |
| 2040 | \$ 3,904,973 | \$ - |
| 2041 | \$ 3,765,509 | \$ - |
| 2042 | \$ 3,626,046 | \$ 3,626,046 |

NOTE:

Useful life of asset: 55.0 years

Source: BAE Urban Economics, Inc. 2012.

Table 17: Midwest Urban Consumer Price Index

| Year | Index (1982=100) | Annual CPI % Change |
|-------------|-----------------------------|--------------------------------|
| 1993 | 140.00 | 2.56% |
| 1994 | 144.00 | 2.86% |
| 1995 | 148.40 | 3.06% |
| 1996 | 153.00 | 3.10% |
| 1997 | 156.70 | 2.42% |
| 1998 | 159.30 | 1.66% |
| 1999 | 162.70 | 2.13% |
| 2000 | 168.30 | 3.44% |
| 2001 | 172.80 | 2.67% |
| 2002 | 174.90 | 1.22% |
| 2003 | 178.30 | 1.94% |
| 2004 | 182.60 | 2.41% |
| 2005 | 188.40 | 3.18% |
| 2006 | 193.00 | 2.44% |
| 2007 | 198.12 | 2.65% |
| 2008 | 205.38 | 3.66% |
| 2009 | 204.06 | -0.64% |
| 2010 | 208.05 | 1.95% |
| 2011 | 214.74 | 3.22% |
| 2012 | 219.10 | 2.03% |

Annual Average**20-years: 2.4%****LCCA Assumption: 0.0%**

Source: U.S. Department of Labor, Bureau of Labor
Statistics; BAE Urban Economics, Inc. 2012.

Table 18: Discount Rates and Factors

| Year | Discount Factors | | Beginning of Year | Calander Year |
|------|------------------|----------|----------------------|------------------|
| | End of Year | Mid-Year | | |
| 1 | 0.9804 | 0.9901 | 1.0000 | 2012 |
| 2 | 0.9612 | 0.9707 | 0.9804 | 2013 |
| 3 | 0.9423 | 0.9517 | 0.9612 | 2014 |
| 4 | 0.9238 | 0.9330 | 0.9423 | 2015 |
| 5 | 0.9057 | 0.9147 | 0.9238 | 2016 |
| 6 | 0.8880 | 0.8968 | 0.9057 | 2017 |
| 7 | 0.8706 | 0.8792 | 0.8880 | 2018 |
| 8 | 0.8535 | 0.8620 | 0.8706 | 2019 |
| 9 | 0.8368 | 0.8451 | 0.8535 | 2020 |
| 10 | 0.8203 | 0.8285 | 0.8368 | 2021 |
| 11 | 0.8043 | 0.8123 | 0.8203 | 2022 |
| 12 | 0.7885 | 0.7963 | 0.8043 | 2023 |
| 13 | 0.7730 | 0.7807 | 0.7885 | 2024 |
| 14 | 0.7579 | 0.7654 | 0.7730 | 2025 |
| 15 | 0.7430 | 0.7504 | 0.7579 | 2026 |
| 16 | 0.7284 | 0.7357 | 0.7430 | 2027 |
| 17 | 0.7142 | 0.7213 | 0.7284 | 2028 |
| 18 | 0.7002 | 0.7071 | 0.7142 | 2029 |
| 19 | 0.6864 | 0.6933 | 0.7002 | 2030 |
| 20 | 0.6730 | 0.6797 | 0.6864 | 2031 |
| 21 | 0.6598 | 0.6663 | 0.6730 | 2032 |
| 22 | 0.6468 | 0.6533 | 0.6598 | 2033 |
| 23 | 0.6342 | 0.6405 | 0.6468 | 2034 |
| 24 | 0.6217 | 0.6279 | 0.6342 | 2035 |
| 25 | 0.6095 | 0.6156 | 0.6217 | 2036 |
| 26 | 0.5976 | 0.6035 | 0.6095 | 2037 |
| 27 | 0.5859 | 0.5917 | 0.5976 | 2038 |
| 28 | 0.5744 | 0.5801 | 0.5859 | 2039 |
| 29 | 0.5631 | 0.5687 | 0.5744 | 2040 |
| 30 | 0.5521 | 0.5576 | 0.5631 | 2041 |
| 31 | 0.5412 | 0.5466 | 0.5521 | 2042 |

Notes:

30-Year real discount rate 2.0%

Mid-year factor: 1.0100

Sources: Office of Management and Budget, OMB Circular A-94,
Appendix C; BAE Urban Economics, 2012.

Life Cycle Cost Analysis (LCCA) Spreadsheet

F. E. Warren, Cheyenne WY

**ESTCP SI 0931
LCCA Demonstration**

Historic Building 323

Mission: General Administrative Office

Prepared by:
BAE Urban Economics, Inc.

December 2012

Table III-47: Life Cycle Cost Analysis Summary: FEW 323

| Project Alternative | Non Discounted Costs by Component | | | Total Costs | | |
|--|-----------------------------------|--------------|----------------|----------------|---------------|---------------------------|
| | Initial | | | Non Discounted | Discounted - | |
| | Investment | Recurring | Residual Value | | No GHG Factor | Discounted - w/GHG Factor |
| FEW 323-01: Sustainment - Status Quo | \$ 1,184,186 | \$ 2,594,721 | \$ - | \$ 3,778,907 | \$ 3,068,097 | \$ 3,181,223 |
| FEW 323-02: Demolition, New Construction | \$ 4,134,303 | \$ 2,308,859 | \$ (1,701,058) | \$ 4,742,104 | \$ 4,800,549 | \$ 4,905,532 |
| FEW 323-03: Modernization with HPS | \$ 2,999,326 | \$ 2,295,437 | \$ (1,355,898) | \$ 3,938,864 | \$ 3,869,683 | \$ 3,950,019 |
| FEW 323-04: Modernization with AT/FP plus Solar PV | \$ 4,326,110 | \$ 2,087,882 | \$ (2,010,279) | \$ 4,403,712 | \$ 4,645,392 | \$ 4,700,302 |

Notes:

| | |
|--------------------------------------|----------|
| Study Period (years): | 30 |
| Real Discount Rate: | 2.00% |
| Average CO2e Value/MT (undiscounted) | \$ 37.35 |
| Base Date: | 10/01/12 |

Sources: Preservation Associates; BAE Urban Economics, 2012.

Table III-48: Greenhouse Gas Valuation Summary: FEW 323

| Project Alternative | GHG Emissions by Scope (MT CO2e) | | | | GHG Value | |
|--|----------------------------------|----------|----------|-------|------------|------------|
| | Scope 1 | Scope 2 | Scope 3 | Total | Non | |
| | | | | | Discounted | Discounted |
| FEW 323-01: Sustainment - Status Quo | 16.38 | 4,203.63 | 119.05 | 4,339 | \$ 162,074 | \$ 113,126 |
| FEW 323-02: Demolition and New Construction | 1.24 | 2,555.39 | 1,035.79 | 3,592 | \$ 133,719 | \$ 104,983 |
| FEW 323-03: Modernization with HPS | 2.47 | 2,478.00 | 450.42 | 2,931 | \$ 109,216 | \$ 80,336 |
| FEW 323-04: Modernization with AT/FP plus Solar PV | 1.24 | 1,281.26 | 579.73 | 1,862 | \$ 69,323 | \$ 54,911 |

Notes:

| | |
|--------------------------------------|----------|
| Study Period (years): | 30 |
| Real Discount Rate: | 2.00% |
| Average CO2e Value/MT (undiscounted) | \$ 37.35 |
| Base Date: | 10/01/12 |

Sources: Center for Resource Solutions; BAE Urban Economics, 2012.

Table 3: Alternatives Summary: FEW 323

| Project Alternative | Building GSF | | Building Features | | Construction Cost | |
|--|--------------|-----------|-------------------|-------|-------------------|--------|
| | Total | Footprint | LEED | AT/FP | Total | Per SF |
| FEW 323-01: Sustainment - Status Quo | 13,485 | 10,385 | n/a | No | \$ 1,184,186 | \$ 88 |
| FEW 323-02: Demolition, New Construction | 13,485 | 10,385 | 54 | Yes | \$ 4,134,303 | \$ 307 |
| FEW 323-03: Modernization with HPS | 13,485 | 10,385 | 57 | Yes | \$ 2,999,326 | \$ 222 |
| FEW 323-04: Modernization w/ AT/FP + PV System | 13,485 | 10,385 | 63 | Yes+ | \$ 4,326,110 | \$ 321 |

Note:

+ Current prescriptive practices and treatments.

Sources: Preservation Associates; Center for Resource Solutions; BAE Urban Economics, 2012.

Table 4: Construction Cost Summary: FEW 323

| Category | Cost estimate | | | |
|---------------------------------|---------------------------|------------------------------------|---------------------------|---|
| | 01 Sustainment-Status Quo | 02 Demolition and New Construction | 03 Modernization with HPS | Modernization with AT/FP plus Solar PV(a) |
| Demolition | \$ 29,293 | \$ 535,911 | \$ 131,080 | \$ 73,596 |
| Services | \$ 348,681 | \$ 1,014,985 | \$ 1,144,756 | \$ 1,496,761 |
| Other Costs | \$ 566,739 | \$ 1,587,779 | \$ 1,047,568 | \$ 1,862,071 |
| Hard cost subtotal | \$ 944,713 | \$ 3,138,675 | \$ 2,323,404 | \$ 3,432,428 |
| General conditions (25%) | \$ 146,467 | \$ 643,171 | \$ 405,229 | \$ 746,601 |
| Security escalation (2%) | \$ 14,647 | \$ 51,454 | \$ 81,046 | \$ 59,728 |
| USACE design (6%) | \$ 36,617 | \$ 154,361 | \$ 97,255 | \$ 44,796 |
| USACE SOIH (5.7%) | \$ 41,743 | \$ 146,643 | \$ 92,392 | \$ 42,556 |
| Soft cost subtotal | \$ 239,474 | \$ 995,629 | \$ 675,922 | \$ 893,682 |
| Construction cost total | \$ 1,184,186 | \$ 4,134,303 | \$ 2,999,326 | \$ 4,326,110 |
| Construction Cost per SF | \$ 88 | \$ 307 | \$ 222 | \$ 321 |
| % Difference from 02 | -71% | N/A | -27% | 5% |

Notes:

(a) FEW 323-04 costs reflects inclusion of rooftop solar PV system..

Sources: Preservation Associates; BAE Urban Economics Inc. 2012.

Table 5: NPV Calculation FEW 323-01 Sustainment-Status Quo

| Mid Year | One Time | | | | | | | Recurring | | | Residual Value | | Net Present Value | | | |
|----------|------------------|--------------|----------------------|------------|-----------|------------------|---------------------------|------------|---------------------|------------------|----------------|------|-------------------|------------|--------------|--------------|
| | New Construction | Major Repair | Temporary Facilities | Relocation | Demo | Site Preparation | Environmental Remediation | Utilities | Repairs Maintenance | Other Operations | Building | Land | Undiscounted Sum | NPV Factor | Mid-Year | Cum NPV |
| 2012 | \$ - | \$ - | \$ - | \$ - | \$ 29,293 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 29,293 | 0.99 | \$ 29,005 | \$ 29,005 |
| 2013 | \$ - | \$ 1,154,893 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 27,054 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 1,241,383 | 0.97 | \$ 1,205,052 | \$ 1,234,057 |
| 2014 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 27,054 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 86,491 | 0.95 | \$ 82,313 | \$ 1,316,370 |
| 2015 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 27,054 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 86,491 | 0.93 | \$ 80,699 | \$ 1,397,069 |
| 2016 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 27,054 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 86,491 | 0.91 | \$ 79,117 | \$ 1,476,186 |
| 2017 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 27,054 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 86,491 | 0.90 | \$ 77,565 | \$ 1,553,751 |
| 2018 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 27,054 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 86,491 | 0.88 | \$ 76,045 | \$ 1,629,796 |
| 2019 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 27,054 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 86,491 | 0.86 | \$ 74,554 | \$ 1,704,349 |
| 2020 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 27,054 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 86,491 | 0.85 | \$ 73,092 | \$ 1,777,441 |
| 2021 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 27,054 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 86,491 | 0.83 | \$ 71,659 | \$ 1,849,099 |
| 2022 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 27,054 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 86,491 | 0.81 | \$ 70,253 | \$ 1,919,353 |
| 2023 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 27,054 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 86,491 | 0.80 | \$ 68,876 | \$ 1,988,229 |
| 2024 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 27,054 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 86,491 | 0.78 | \$ 67,525 | \$ 2,055,754 |
| 2025 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 27,054 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 86,491 | 0.77 | \$ 66,201 | \$ 2,121,955 |
| 2026 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 27,054 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 86,491 | 0.75 | \$ 64,903 | \$ 2,186,859 |
| 2027 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 27,054 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 86,491 | 0.74 | \$ 63,631 | \$ 2,250,489 |
| 2028 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 27,054 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 86,491 | 0.72 | \$ 62,383 | \$ 2,312,872 |
| 2029 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 27,054 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 86,491 | 0.71 | \$ 61,160 | \$ 2,374,032 |
| 2030 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 27,054 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 86,491 | 0.69 | \$ 59,961 | \$ 2,433,993 |
| 2031 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 27,054 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 86,491 | 0.68 | \$ 58,785 | \$ 2,492,778 |
| 2032 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 27,054 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 86,491 | 0.67 | \$ 57,632 | \$ 2,550,410 |
| 2033 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 27,054 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 86,491 | 0.65 | \$ 56,502 | \$ 2,606,912 |
| 2034 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 27,054 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 86,491 | 0.64 | \$ 55,394 | \$ 2,662,307 |
| 2035 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 27,054 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 86,491 | 0.63 | \$ 54,308 | \$ 2,716,615 |
| 2036 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 27,054 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 86,491 | 0.62 | \$ 53,243 | \$ 2,769,858 |
| 2037 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 27,054 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 86,491 | 0.60 | \$ 52,199 | \$ 2,822,058 |
| 2038 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 27,054 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 86,491 | 0.59 | \$ 51,176 | \$ 2,873,233 |
| 2039 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 27,054 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 86,491 | 0.58 | \$ 50,172 | \$ 2,923,406 |
| 2040 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 27,054 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 86,491 | 0.57 | \$ 49,189 | \$ 2,972,594 |
| 2041 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 27,054 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 86,491 | 0.56 | \$ 48,224 | \$ 3,020,818 |
| 2042 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 27,054 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 86,491 | 0.55 | \$ 47,279 | \$ 3,068,097 |
| TOTALS | \$ - | \$ 1,154,893 | \$ - | \$ - | \$ 29,293 | \$ - | \$ - | \$ 811,606 | \$ 540,713 | \$ 1,242,402 | \$ - | \$ - | \$ 3,778,907 | | \$ 3,068,097 | \$ 3,068,097 |

Notes:

Project Alternative Summary

| | |
|--------------------|--------------|
| Capital Costs | \$ 1,184,186 |
| Recurring Costs | \$ 2,594,721 |
| Residual Value | \$ - |
| Non Discounted Sum | \$ 3,778,907 |
| Cum NPV | \$ 3,068,097 |

Key Assumptions:

| | | | |
|-----------------------------|------------------|---------------------------------|--|
| Discount Rate | 2.00% | Repairs and Maintenance | \$ 1.34 |
| Study Period | 30 years | Other Operations | \$ 3.07 |
| BaseYear | 2012 | Cleaning per sq. ft. | \$ 1.34 |
| Report Output | Constant Dollars | Roads and Grounds | \$ 0.67 |
| Cost per sq. ft. | \$86 | Administrative | \$ 1.06 |
| Construction Period (years) | 1 | BOMA Expense CPI Adjustment | 2.03% |
| Building Size (sq. ft.) | 13,485 | Effective utilities per sq. ft. | \$ 2.01 Not from BOMA; calculated based on treatment specific energy usage |

Source: BAE Urban Economics, Inc., 2012.

Table 6: Schedule of Recurring Expenditures FEW 323-01 Sustainment-Status Quo

| Year | Total Annual Expenditures | Electrical | | | Natural Gas | | | Water/Sewer (a) | | | | | |
|------|---------------------------|------------|---------|----------|-------------|-------|----------|-----------------|-------|---------|-------|---------|-------|
| | | Total Cost | kWh | \$/kWh | Total Cost | MMBtu | \$/MMBtu | Total Cost | Water | \$/Kgal | Waste | \$/Kgal | Other |
| 2012 | \$ 27,054 | \$ 24,302 | 411,895 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2013 | \$ 27,054 | \$ 24,302 | 411,895 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2014 | \$ 27,054 | \$ 24,302 | 411,895 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2015 | \$ 27,054 | \$ 24,302 | 411,895 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2016 | \$ 27,054 | \$ 24,302 | 411,895 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2017 | \$ 27,054 | \$ 24,302 | 411,895 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2018 | \$ 27,054 | \$ 24,302 | 411,895 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2019 | \$ 27,054 | \$ 24,302 | 411,895 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2020 | \$ 27,054 | \$ 24,302 | 411,895 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2021 | \$ 27,054 | \$ 24,302 | 411,895 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2022 | \$ 27,054 | \$ 24,302 | 411,895 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2023 | \$ 27,054 | \$ 24,302 | 411,895 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2024 | \$ 27,054 | \$ 24,302 | 411,895 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2025 | \$ 27,054 | \$ 24,302 | 411,895 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2026 | \$ 27,054 | \$ 24,302 | 411,895 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2027 | \$ 27,054 | \$ 24,302 | 411,895 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2028 | \$ 27,054 | \$ 24,302 | 411,895 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2029 | \$ 27,054 | \$ 24,302 | 411,895 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2030 | \$ 27,054 | \$ 24,302 | 411,895 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2031 | \$ 27,054 | \$ 24,302 | 411,895 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2032 | \$ 27,054 | \$ 24,302 | 411,895 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2033 | \$ 27,054 | \$ 24,302 | 411,895 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2034 | \$ 27,054 | \$ 24,302 | 411,895 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2035 | \$ 27,054 | \$ 24,302 | 411,895 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2036 | \$ 27,054 | \$ 24,302 | 411,895 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2037 | \$ 27,054 | \$ 24,302 | 411,895 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2038 | \$ 27,054 | \$ 24,302 | 411,895 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2039 | \$ 27,054 | \$ 24,302 | 411,895 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2040 | \$ 27,054 | \$ 24,302 | 411,895 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2041 | \$ 27,054 | \$ 24,302 | 411,895 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2042 | \$ 27,054 | \$ 24,302 | 411,895 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |

Notes:

(a) Water and sewer combined and calculated on square foot basis based upon BOMA ERR data.

| | |
|-----------------------------|---|
| CPI adjustment factor: | 2.03% bring 2011 BOMA ERR data to 2012 dollars. |
| Water/sewer utility expense | \$0.20 per sq. ft. |
| Building total sq. ft. | 13,485 |

Source: BAE Urban Economics, 2012.

**Table 7: Depreciation Schedule & Residual Value: FEW
323-01 Demolition and New Construction**

| Period | Depreciation Schedule | Residual Value |
|---------------|----------------------------------|---------------------------|
| 2012 | \$ - | \$ - |
| 2013 | \$ 1,154,893 | \$ - |
| 2014 | \$ 1,097,148 | \$ - |
| 2015 | \$ 1,039,404 | \$ - |
| 2016 | \$ 981,659 | \$ - |
| 2017 | \$ 923,914 | \$ - |
| 2018 | \$ 866,170 | \$ - |
| 2019 | \$ 808,425 | \$ - |
| 2020 | \$ 750,680 | \$ - |
| 2021 | \$ 692,936 | \$ - |
| 2022 | \$ 635,191 | \$ - |
| 2023 | \$ 577,446 | \$ - |
| 2024 | \$ 519,702 | \$ - |
| 2025 | \$ 461,957 | \$ - |
| 2026 | \$ 404,212 | \$ - |
| 2027 | \$ 346,468 | \$ - |
| 2028 | \$ 288,723 | \$ - |
| 2029 | \$ 230,979 | \$ - |
| 2030 | \$ 173,234 | \$ - |
| 2031 | \$ 115,489 | \$ - |
| 2032 | \$ 57,745 | \$ - |
| 2033 | \$ 0 | \$ - |
| 2034 | \$ - | \$ - |
| 2035 | \$ - | \$ - |
| 2036 | \$ - | \$ - |
| 2037 | \$ - | \$ - |
| 2038 | \$ - | \$ - |
| 2039 | \$ - | \$ - |
| 2040 | \$ - | \$ - |
| 2041 | \$ - | \$ - |
| 2042 | \$ - | \$ - |

NOTE:

Useful life of asset: 20.0 years

Source: BAE Urban Economics, Inc. 2012.

Table 8: NPV Calculation FEW 323-02 Demolition and New Construction

| Mid Year | One Time | | | | | | | Recurring | | | Residual Value | | Net Present Value | | | |
|----------|------------------|--------------|----------------------|------------|------------|------------------|---------------------------|------------|---------------------|------------------|----------------|------|-------------------|------------|--------------|--------------|
| | New Construction | Major Repair | Temporary Facilities | Relocation | Demo | Site Preparation | Environmental Remediation | Utilities | Repairs Maintenance | Other Operations | Building | Land | Undiscounted Sum | NPV Factor | Mid-Year | Cum NPV |
| 2012 | \$ - | \$ - | \$ - | \$ - | \$ 535,911 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 535,911 | 0.99 | \$ 530,631 | \$ 530,631 |
| 2013 | \$ - | \$ 3,598,393 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,525 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 3,675,355 | 0.97 | \$ 3,567,788 | \$ 4,098,418 |
| 2014 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,525 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,962 | 0.95 | \$ 73,245 | \$ 4,171,663 |
| 2015 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,525 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,962 | 0.93 | \$ 71,808 | \$ 4,243,471 |
| 2016 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,525 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,962 | 0.91 | \$ 70,400 | \$ 4,313,872 |
| 2017 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,525 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,962 | 0.90 | \$ 69,020 | \$ 4,382,892 |
| 2018 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,525 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,962 | 0.88 | \$ 67,667 | \$ 4,450,558 |
| 2019 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,525 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,962 | 0.86 | \$ 66,340 | \$ 4,516,898 |
| 2020 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,525 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,962 | 0.85 | \$ 65,039 | \$ 4,581,938 |
| 2021 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,525 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,962 | 0.83 | \$ 63,764 | \$ 4,645,701 |
| 2022 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,525 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,962 | 0.81 | \$ 62,514 | \$ 4,708,215 |
| 2023 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,525 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,962 | 0.80 | \$ 61,288 | \$ 4,769,503 |
| 2024 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,525 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,962 | 0.78 | \$ 60,086 | \$ 4,829,589 |
| 2025 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,525 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,962 | 0.77 | \$ 58,908 | \$ 4,888,497 |
| 2026 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,525 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,962 | 0.75 | \$ 57,753 | \$ 4,946,250 |
| 2027 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,525 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,962 | 0.74 | \$ 56,620 | \$ 5,002,870 |
| 2028 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,525 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,962 | 0.72 | \$ 55,510 | \$ 5,058,380 |
| 2029 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,525 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,962 | 0.71 | \$ 54,422 | \$ 5,112,802 |
| 2030 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,525 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,962 | 0.69 | \$ 53,355 | \$ 5,166,157 |
| 2031 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,525 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,962 | 0.68 | \$ 52,309 | \$ 5,218,465 |
| 2032 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,525 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,962 | 0.67 | \$ 51,283 | \$ 5,269,748 |
| 2033 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,525 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,962 | 0.65 | \$ 50,277 | \$ 5,320,026 |
| 2034 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,525 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,962 | 0.64 | \$ 49,292 | \$ 5,369,317 |
| 2035 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,525 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,962 | 0.63 | \$ 48,325 | \$ 5,417,642 |
| 2036 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,525 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,962 | 0.62 | \$ 47,377 | \$ 5,465,020 |
| 2037 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,525 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,962 | 0.60 | \$ 46,448 | \$ 5,511,468 |
| 2038 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,525 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,962 | 0.59 | \$ 45,538 | \$ 5,557,006 |
| 2039 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,525 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,962 | 0.58 | \$ 44,645 | \$ 5,601,651 |
| 2040 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,525 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,962 | 0.57 | \$ 43,769 | \$ 5,645,420 |
| 2041 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,525 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,962 | 0.56 | \$ 42,911 | \$ 5,688,331 |
| 2042 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,525 | \$ 18,024 | \$ 41,413 | \$ (1,701,058) | \$ - | \$ (1,624,096) | 0.55 | \$ (887,782) | \$ 4,800,549 |
| TOTALS | \$ - | \$ 3,598,393 | \$ - | \$ - | \$ 535,911 | \$ - | \$ - | \$ 525,744 | \$ 540,713 | \$ 1,242,402 | \$ (1,701,058) | \$ - | \$ 4,742,104 | | \$ 4,800,549 | \$ 4,800,549 |

Notes:

Project Alternative Summary

| | |
|--------------------|----------------|
| Capital Costs | \$ 4,134,303 |
| Recurring Costs | \$ 2,308,859 |
| Residual Value | \$ (1,701,058) |
| Non Discounted Sum | \$ 4,742,104 |
| Cum NPV | \$ 4,800,549 |

Key Assumptions:

| | | | |
|-----------------------------|------------------|---------------------------------|---------|
| Discount Rate | 2.00% | Repairs and Maintenance | \$ 1.34 |
| Study Period | 30 years | Other Operations | \$ 3.07 |
| BaseYear | 2012 | Cleaning per sq. ft. | \$ 1.34 |
| Report Output | Constant Dollars | Roads and Grounds | \$ 0.67 |
| Cost per sq. ft. | \$267 | Administrative | \$ 1.06 |
| Construction Period (years) | 1 | BOMA Expense CPI Adjustment | 2.03% |
| Building Size (sq. ft.) | 13,485 | Effective utilities per sq. ft. | \$ 1.30 |

Not from BOMA; calculated based on treatment specific energy usage

Source: BAE Urban Economics, 2012.

Table 9: Schedule of Recurring Expenditures FEW 323-02 Demolition and New Construction

| Year | Total Annual Expenditures | Electrical | | | Natural Gas | | | Water/Sewer (a) | | | | | |
|------|---------------------------|------------|---------|----------|-------------|-------|----------|-----------------|-------|---------|-------|---------|-------|
| | | Total Cost | kWh | \$/kWh | Total Cost | MMBtu | \$/MMBtu | Total Cost | Water | \$/Kgal | Waste | \$/Kgal | Other |
| 2012 | \$ 17,525 | \$ 14,773 | 250,391 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2013 | \$ 17,525 | \$ 14,773 | 250,391 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2014 | \$ 17,525 | \$ 14,773 | 250,391 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2015 | \$ 17,525 | \$ 14,773 | 250,391 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2016 | \$ 17,525 | \$ 14,773 | 250,391 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2017 | \$ 17,525 | \$ 14,773 | 250,391 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2018 | \$ 17,525 | \$ 14,773 | 250,391 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2019 | \$ 17,525 | \$ 14,773 | 250,391 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2020 | \$ 17,525 | \$ 14,773 | 250,391 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2021 | \$ 17,525 | \$ 14,773 | 250,391 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2022 | \$ 17,525 | \$ 14,773 | 250,391 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2023 | \$ 17,525 | \$ 14,773 | 250,391 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2024 | \$ 17,525 | \$ 14,773 | 250,391 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2025 | \$ 17,525 | \$ 14,773 | 250,391 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2026 | \$ 17,525 | \$ 14,773 | 250,391 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2027 | \$ 17,525 | \$ 14,773 | 250,391 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2028 | \$ 17,525 | \$ 14,773 | 250,391 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2029 | \$ 17,525 | \$ 14,773 | 250,391 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2030 | \$ 17,525 | \$ 14,773 | 250,391 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2031 | \$ 17,525 | \$ 14,773 | 250,391 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2032 | \$ 17,525 | \$ 14,773 | 250,391 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2033 | \$ 17,525 | \$ 14,773 | 250,391 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2034 | \$ 17,525 | \$ 14,773 | 250,391 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2035 | \$ 17,525 | \$ 14,773 | 250,391 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2036 | \$ 17,525 | \$ 14,773 | 250,391 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2037 | \$ 17,525 | \$ 14,773 | 250,391 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2038 | \$ 17,525 | \$ 14,773 | 250,391 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2039 | \$ 17,525 | \$ 14,773 | 250,391 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2040 | \$ 17,525 | \$ 14,773 | 250,391 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2041 | \$ 17,525 | \$ 14,773 | 250,391 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2042 | \$ 17,525 | \$ 14,773 | 250,391 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |

Notes:

(a) Water and sewer combined and calculated on square foot basis based upon BOMA ERR data.

| | |
|-----------------------------|---|
| CPI adjustment factor: | 2.03% bring 2011 BOMA ERR data to 2012 dollars. |
| Water/sewer utility expense | \$0.20 per sq. ft. |
| Building total sq. ft. | 13,485 |

Source: BAE Urban Economics, 2012.

Table 10: Depreciation Schedule & Residual Value: FEW 323-02 Demolition and New Construction

| Period | Depreciation Schedule | Residual Value |
|---------------|------------------------------|-----------------------|
| 2012 | \$ - | \$ - |
| 2013 | \$ 3,598,393 | \$ - |
| 2014 | \$ 3,532,967 | \$ - |
| 2015 | \$ 3,467,542 | \$ - |
| 2016 | \$ 3,402,117 | \$ - |
| 2017 | \$ 3,336,691 | \$ - |
| 2018 | \$ 3,271,266 | \$ - |
| 2019 | \$ 3,205,841 | \$ - |
| 2020 | \$ 3,140,415 | \$ - |
| 2021 | \$ 3,074,990 | \$ - |
| 2022 | \$ 3,009,565 | \$ - |
| 2023 | \$ 2,944,139 | \$ - |
| 2024 | \$ 2,878,714 | \$ - |
| 2025 | \$ 2,813,289 | \$ - |
| 2026 | \$ 2,747,864 | \$ - |
| 2027 | \$ 2,682,438 | \$ - |
| 2028 | \$ 2,617,013 | \$ - |
| 2029 | \$ 2,551,588 | \$ - |
| 2030 | \$ 2,486,162 | \$ - |
| 2031 | \$ 2,420,737 | \$ - |
| 2032 | \$ 2,355,312 | \$ - |
| 2033 | \$ 2,289,886 | \$ - |
| 2034 | \$ 2,224,461 | \$ - |
| 2035 | \$ 2,159,036 | \$ - |
| 2036 | \$ 2,093,610 | \$ - |
| 2037 | \$ 2,028,185 | \$ - |
| 2038 | \$ 1,962,760 | \$ - |
| 2039 | \$ 1,897,334 | \$ - |
| 2040 | \$ 1,831,909 | \$ - |
| 2041 | \$ 1,766,484 | \$ - |
| 2042 | \$ 1,701,058 | \$ 1,701,058 |

NOTE:

Useful life of asset: 55.0 years

Source: BAE Urban Economics, Inc. 2012.

Table 11: NPV Calculation FEW 323-03 Modernization with HPS

| Mid Year | One Time | | | | | | | Recurring | | | Residual Value | | Net Present Value | | | |
|----------|------------------|--------------|----------------------|------------|------------|------------------|---------------------------|------------|---------------------|-----------|----------------|------|-------------------|------------|--------------|--------------|
| | New Construction | Major Repair | Temporary Facilities | Relocation | Demo | Site Preparation | Environmental Remediation | Utilities | Repairs Maintenance | Other s | Building | Land | Undiscounted Sum | NPV Factor | Mid-Year | Cum NPV |
| 2012 | \$ - | \$ - | \$ - | \$ - | \$ 131,080 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 131,080 | 0.99 | \$ 129,788 | \$ 129,788 |
| 2013 | \$ - | \$ 2,868,246 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,077 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 2,944,761 | 0.97 | \$ 2,858,576 | \$ 2,988,364 |
| 2014 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,077 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,515 | 0.95 | \$ 72,819 | \$ 3,061,183 |
| 2015 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,077 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,515 | 0.93 | \$ 71,391 | \$ 3,132,574 |
| 2016 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,077 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,515 | 0.91 | \$ 69,991 | \$ 3,202,565 |
| 2017 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,077 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,515 | 0.90 | \$ 68,619 | \$ 3,271,184 |
| 2018 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,077 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,515 | 0.88 | \$ 67,273 | \$ 3,338,457 |
| 2019 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,077 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,515 | 0.86 | \$ 65,954 | \$ 3,404,411 |
| 2020 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,077 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,515 | 0.85 | \$ 64,661 | \$ 3,469,072 |
| 2021 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,077 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,515 | 0.83 | \$ 63,393 | \$ 3,532,466 |
| 2022 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,077 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,515 | 0.81 | \$ 62,150 | \$ 3,594,616 |
| 2023 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,077 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,515 | 0.80 | \$ 60,932 | \$ 3,655,547 |
| 2024 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,077 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,515 | 0.78 | \$ 59,737 | \$ 3,715,284 |
| 2025 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,077 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,515 | 0.77 | \$ 58,565 | \$ 3,773,849 |
| 2026 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,077 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,515 | 0.75 | \$ 57,417 | \$ 3,831,267 |
| 2027 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,077 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,515 | 0.74 | \$ 56,291 | \$ 3,887,558 |
| 2028 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,077 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,515 | 0.72 | \$ 55,188 | \$ 3,942,746 |
| 2029 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,077 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,515 | 0.71 | \$ 54,105 | \$ 3,996,851 |
| 2030 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,077 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,515 | 0.69 | \$ 53,045 | \$ 4,049,896 |
| 2031 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,077 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,515 | 0.68 | \$ 52,004 | \$ 4,101,900 |
| 2032 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,077 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,515 | 0.67 | \$ 50,985 | \$ 4,152,885 |
| 2033 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,077 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,515 | 0.65 | \$ 49,985 | \$ 4,202,870 |
| 2034 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,077 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,515 | 0.64 | \$ 49,005 | \$ 4,251,875 |
| 2035 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,077 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,515 | 0.63 | \$ 48,044 | \$ 4,299,919 |
| 2036 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,077 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,515 | 0.62 | \$ 47,102 | \$ 4,347,021 |
| 2037 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,077 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,515 | 0.60 | \$ 46,178 | \$ 4,393,199 |
| 2038 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,077 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,515 | 0.59 | \$ 45,273 | \$ 4,438,472 |
| 2039 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,077 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,515 | 0.58 | \$ 44,385 | \$ 4,482,858 |
| 2040 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,077 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,515 | 0.57 | \$ 43,515 | \$ 4,526,373 |
| 2041 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,077 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 76,515 | 0.56 | \$ 42,662 | \$ 4,569,035 |
| 2042 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 17,077 | \$ 18,024 | \$ 41,413 | \$ (1,355,898) | \$ - | \$ (1,279,384) | 0.55 | \$ (699,352) | \$ 3,869,683 |
| TOTALS | \$ - | \$ 2,868,246 | \$ - | \$ - | \$ 131,080 | \$ - | \$ - | \$ 512,322 | \$ 540,713 | ##### | \$ (1,355,898) | \$ - | \$ 3,938,864 | | \$ 3,869,683 | \$ 3,869,683 |

Notes:

Project Alternative Summary

| | |
|--------------------|----------------|
| Capital Costs | \$ 2,999,326 |
| Recurring Costs | \$ 2,295,437 |
| Residual Value | \$ (1,355,898) |
| Non Discounted Sum | \$ 3,938,864 |
| Cum NPV | \$ 3,869,683 |

Key Assumptions:

| | | | |
|-----------------------------|------------------|---------------------------------|--|
| Discount Rate | 2.00% | Repairs and Maintenance | \$ 1.34 |
| Study Period | 30 years | Other Operations | \$ 3.07 |
| BaseYear | 2012 | Cleaning per sq. ft. | \$ 1.34 |
| Report Output | Constant Dollars | Roads and Grounds | \$ 0.67 |
| Cost per sq. ft. | \$213 | Administrative | \$ 1.06 |
| Construction Period (years) | 1 | BOMA Expense CPI Adjustmer | 2.03% |
| Building Size (sq. ft.) | 13,485 | Effective utilities per sq. ft. | \$ 1.27 Not from BOMA; calculated based on treatment specific energy usage |

Source: BAE Urban Economics, 2012.

Table 12: Schedule of Recurring Expenditures FEW 323-03 Modernization with HPS

| Year | Total Annual Expenditures | Electrical | | | Natural Gas | | | Water/Sewer (a) | | | | | |
|------|---------------------------|------------|---------|----------|-------------|-------|----------|-----------------|-------|---------|-------|---------|-------|
| | | Total Cost | kWh | \$/kWh | Total Cost | MMBtu | \$/MMBtu | Total Cost | Water | \$/Kgal | Waste | \$/Kgal | Other |
| 2012 | \$ 17,077 | \$ 14,326 | 242,808 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2013 | \$ 17,077 | \$ 14,326 | 242,808 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2014 | \$ 17,077 | \$ 14,326 | 242,808 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2015 | \$ 17,077 | \$ 14,326 | 242,808 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2016 | \$ 17,077 | \$ 14,326 | 242,808 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2017 | \$ 17,077 | \$ 14,326 | 242,808 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2018 | \$ 17,077 | \$ 14,326 | 242,808 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2019 | \$ 17,077 | \$ 14,326 | 242,808 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2020 | \$ 17,077 | \$ 14,326 | 242,808 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2021 | \$ 17,077 | \$ 14,326 | 242,808 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2022 | \$ 17,077 | \$ 14,326 | 242,808 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2023 | \$ 17,077 | \$ 14,326 | 242,808 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2024 | \$ 17,077 | \$ 14,326 | 242,808 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2025 | \$ 17,077 | \$ 14,326 | 242,808 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2026 | \$ 17,077 | \$ 14,326 | 242,808 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2027 | \$ 17,077 | \$ 14,326 | 242,808 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2028 | \$ 17,077 | \$ 14,326 | 242,808 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2029 | \$ 17,077 | \$ 14,326 | 242,808 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2030 | \$ 17,077 | \$ 14,326 | 242,808 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2031 | \$ 17,077 | \$ 14,326 | 242,808 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2032 | \$ 17,077 | \$ 14,326 | 242,808 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2033 | \$ 17,077 | \$ 14,326 | 242,808 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2034 | \$ 17,077 | \$ 14,326 | 242,808 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2035 | \$ 17,077 | \$ 14,326 | 242,808 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2036 | \$ 17,077 | \$ 14,326 | 242,808 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2037 | \$ 17,077 | \$ 14,326 | 242,808 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2038 | \$ 17,077 | \$ 14,326 | 242,808 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2039 | \$ 17,077 | \$ 14,326 | 242,808 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2040 | \$ 17,077 | \$ 14,326 | 242,808 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2041 | \$ 17,077 | \$ 14,326 | 242,808 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2042 | \$ 17,077 | \$ 14,326 | 242,808 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |

Notes:

- (a) Water and sewer combined and calculated on square foot basis based upon BOMA ERR data.
 - CPI adjustment factor: 2.03% bring 2011 BOMA ERR data to 2012 dollars.
 - Water/sewer utility expense \$0.20 per sq. ft.
 - Building total sq. ft. 13,485

Source: BAE Urban Economics, 2012.

Table 13: Depreciation Schedule & Residual Value: FEW 323-03 Modernization with HPS

| Period | Depreciation Schedule | Residual Value |
|--------|-----------------------|----------------|
| 2012 | \$ - | \$ - |
| 2013 | \$ 2,868,246 | \$ - |
| 2014 | \$ 2,816,096 | \$ - |
| 2015 | \$ 2,763,946 | \$ - |
| 2016 | \$ 2,711,796 | \$ - |
| 2017 | \$ 2,659,646 | \$ - |
| 2018 | \$ 2,607,496 | \$ - |
| 2019 | \$ 2,555,346 | \$ - |
| 2020 | \$ 2,503,196 | \$ - |
| 2021 | \$ 2,451,047 | \$ - |
| 2022 | \$ 2,398,897 | \$ - |
| 2023 | \$ 2,346,747 | \$ - |
| 2024 | \$ 2,294,597 | \$ - |
| 2025 | \$ 2,242,447 | \$ - |
| 2026 | \$ 2,190,297 | \$ - |
| 2027 | \$ 2,138,147 | \$ - |
| 2028 | \$ 2,085,997 | \$ - |
| 2029 | \$ 2,033,847 | \$ - |
| 2030 | \$ 1,981,697 | \$ - |
| 2031 | \$ 1,929,547 | \$ - |
| 2032 | \$ 1,877,397 | \$ - |
| 2033 | \$ 1,825,247 | \$ - |
| 2034 | \$ 1,773,098 | \$ - |
| 2035 | \$ 1,720,948 | \$ - |
| 2036 | \$ 1,668,798 | \$ - |
| 2037 | \$ 1,616,648 | \$ - |
| 2038 | \$ 1,564,498 | \$ - |
| 2039 | \$ 1,512,348 | \$ - |
| 2040 | \$ 1,460,198 | \$ - |
| 2041 | \$ 1,408,048 | \$ - |
| 2042 | \$ 1,355,898 | \$ 1,355,898 |

NOTE:

Useful life of asset: 55.0 years

Source: BAE Urban Economics, Inc. 2012.

Table 14: NPV Calculation FEW 323-04 Modernization with AT/FP plus Solar PV

| Mid Year | One Time | | | | | | | Recurring | | | Residual Value | | Net Present Value | | | |
|---------------|------------------|--------------|----------------------|------------|-----------|------------------|---------------------------|------------|---------------------|------------------|----------------|------|-------------------|------------|----------------|--------------|
| | New Construction | Major Repair | Temporary Facilities | Relocation | Demo | Site Preparation | Environmental Remediation | Utilities | Repairs Maintenance | Other Operations | Building | Land | Undiscounted Sum | NPV Factor | Mid-Year | Cum NPV |
| 2012 | \$ - | \$ - | \$ - | \$ - | \$ 73,596 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 73,596 | 0.99 | \$ 72,871 | \$ 72,871 |
| 2013 | \$ - | \$ 4,252,514 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 10,159 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 4,322,110 | 0.97 | \$ 4,195,614 | \$ 4,268,485 |
| 2014 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 10,159 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 69,596 | 0.95 | \$ 66,234 | \$ 4,334,720 |
| 2015 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 10,159 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 69,596 | 0.93 | \$ 64,936 | \$ 4,399,655 |
| 2016 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 10,159 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 69,596 | 0.91 | \$ 63,663 | \$ 4,463,318 |
| 2017 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 10,159 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 69,596 | 0.90 | \$ 62,414 | \$ 4,525,732 |
| 2018 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 10,159 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 69,596 | 0.88 | \$ 61,190 | \$ 4,586,923 |
| 2019 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 10,159 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 69,596 | 0.86 | \$ 59,991 | \$ 4,646,913 |
| 2020 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 10,159 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 69,596 | 0.85 | \$ 58,814 | \$ 4,705,728 |
| 2021 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 10,159 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 69,596 | 0.83 | \$ 57,661 | \$ 4,763,389 |
| 2022 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 10,159 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 69,596 | 0.81 | \$ 56,531 | \$ 4,819,919 |
| 2023 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 10,159 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 69,596 | 0.80 | \$ 55,422 | \$ 4,875,341 |
| 2024 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 10,159 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 69,596 | 0.78 | \$ 54,335 | \$ 4,929,677 |
| 2025 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 10,159 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 69,596 | 0.77 | \$ 53,270 | \$ 4,982,947 |
| 2026 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 10,159 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 69,596 | 0.75 | \$ 52,225 | \$ 5,035,172 |
| 2027 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 10,159 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 69,596 | 0.74 | \$ 51,201 | \$ 5,086,373 |
| 2028 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 10,159 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 69,596 | 0.72 | \$ 50,197 | \$ 5,136,571 |
| 2029 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 10,159 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 69,596 | 0.71 | \$ 49,213 | \$ 5,185,784 |
| 2030 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 10,159 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 69,596 | 0.69 | \$ 48,248 | \$ 5,234,032 |
| 2031 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 10,159 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 69,596 | 0.68 | \$ 47,302 | \$ 5,281,335 |
| 2032 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 10,159 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 69,596 | 0.67 | \$ 46,375 | \$ 5,327,709 |
| 2033 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 10,159 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 69,596 | 0.65 | \$ 45,465 | \$ 5,373,175 |
| 2034 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 10,159 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 69,596 | 0.64 | \$ 44,574 | \$ 5,417,749 |
| 2035 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 10,159 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 69,596 | 0.63 | \$ 43,700 | \$ 5,461,448 |
| 2036 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 10,159 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 69,596 | 0.62 | \$ 42,843 | \$ 5,504,292 |
| 2037 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 10,159 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 69,596 | 0.60 | \$ 42,003 | \$ 5,546,295 |
| 2038 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 10,159 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 69,596 | 0.59 | \$ 41,179 | \$ 5,587,474 |
| 2039 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 10,159 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 69,596 | 0.58 | \$ 40,372 | \$ 5,627,846 |
| 2040 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 10,159 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 69,596 | 0.57 | \$ 39,580 | \$ 5,667,426 |
| 2041 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 10,159 | \$ 18,024 | \$ 41,413 | \$ - | \$ - | \$ 69,596 | 0.56 | \$ 38,804 | \$ 5,706,231 |
| 2042 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 10,159 | \$ 18,024 | \$ 41,413 | \$ (2,010,279) | \$ - | \$ (1,940,683) | 0.55 | \$ (1,060,839) | \$ 4,645,392 |
| TOTALS | \$ - | \$ 4,252,514 | \$ - | \$ - | \$ 73,596 | \$ - | \$ - | \$ 304,767 | \$ 540,713 | \$ 1,242,402 | \$ (2,010,279) | \$ - | \$ 4,403,712 | | \$ 4,645,392 | \$ 4,645,392 |

Notes:

Project Alternative Summary

| | |
|--------------------|----------------|
| Capital Costs | \$ 4,326,110 |
| Recurring Costs | \$ 2,087,882 |
| Residual Value | \$ (2,010,279) |
| Non Discounted Sum | \$ 4,403,712 |
| Cum NPV | \$ 4,645,392 |

Key Assumptions:

| | | | |
|-----------------------------|------------------|---------------------------------|---------|
| Discount Rate | 2.00% | Repairs and Maintenance | \$ 1.34 |
| Study Period | 30 years | Other Operations | \$ 3.07 |
| BaseYear | 2012 | Cleaning per sq. ft. | \$ 1.34 |
| Report Output | Constant Dollars | Roads and Grounds | \$ 0.67 |
| Cost per sq. ft. | \$315 | Administrative | \$ 1.06 |
| Construction Period (years) | 1 | BOMA Expense CPI Adjustment | 2.03% |
| Building Size (sq. ft.) | 13,485 | Effective utilities per sq. ft. | \$ 0.75 |

Not from BOMA; calculated based on treatment specific energy usage

Source: BAE Urban Economics, 2012.

Table 15: Schedule of Recurring Expenditures FEW 323-04 Modernization with AT/FP plus Solar PV

| Year | Total Annual Expenditures | Electrical | | | Natural Gas | | | Water/Sewer (a) | | | | | |
|------|---------------------------|------------|---------|----------|-------------|-------|----------|-----------------|-------|---------|-------|---------|-------|
| | | Total Cost | kWh | \$/kWh | Total Cost | MMBtu | \$/MMBtu | Total Cost | Water | \$/Kgal | Waste | \$/Kgal | Other |
| 2012 | \$ 10,159 | \$ 7,407 | 125,545 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2013 | \$ 10,159 | \$ 7,407 | 125,545 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2014 | \$ 10,159 | \$ 7,407 | 125,545 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2015 | \$ 10,159 | \$ 7,407 | 125,545 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2016 | \$ 10,159 | \$ 7,407 | 125,545 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2017 | \$ 10,159 | \$ 7,407 | 125,545 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2018 | \$ 10,159 | \$ 7,407 | 125,545 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2019 | \$ 10,159 | \$ 7,407 | 125,545 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2020 | \$ 10,159 | \$ 7,407 | 125,545 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2021 | \$ 10,159 | \$ 7,407 | 125,545 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2022 | \$ 10,159 | \$ 7,407 | 125,545 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2023 | \$ 10,159 | \$ 7,407 | 125,545 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2024 | \$ 10,159 | \$ 7,407 | 125,545 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2025 | \$ 10,159 | \$ 7,407 | 125,545 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2026 | \$ 10,159 | \$ 7,407 | 125,545 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2027 | \$ 10,159 | \$ 7,407 | 125,545 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2028 | \$ 10,159 | \$ 7,407 | 125,545 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2029 | \$ 10,159 | \$ 7,407 | 125,545 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2030 | \$ 10,159 | \$ 7,407 | 125,545 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2031 | \$ 10,159 | \$ 7,407 | 125,545 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2032 | \$ 10,159 | \$ 7,407 | 125,545 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2033 | \$ 10,159 | \$ 7,407 | 125,545 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2034 | \$ 10,159 | \$ 7,407 | 125,545 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2035 | \$ 10,159 | \$ 7,407 | 125,545 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2036 | \$ 10,159 | \$ 7,407 | 125,545 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2037 | \$ 10,159 | \$ 7,407 | 125,545 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2038 | \$ 10,159 | \$ 7,407 | 125,545 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2039 | \$ 10,159 | \$ 7,407 | 125,545 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2040 | \$ 10,159 | \$ 7,407 | 125,545 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2041 | \$ 10,159 | \$ 7,407 | 125,545 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |
| 2042 | \$ 10,159 | \$ 7,407 | 125,545 | \$ 0.059 | \$ - | | \$ 5.39 | \$ 2,752 | | | | | \$ - |

Notes:

(a) Water and sewer combined and calculated on square foot basis based upon BOMA ERR data.

- CPI adjustment factor: 2.03% bring 2011 BOMA ERR data to 2012 dollars.
- Water/sewer utility expense \$0.20 per sq. ft.
- Building total sq. ft. 13,485

Source: BAE Urban Economics, 2012.

**Table 16: Depreciation Schedule & Residual Value: FEW
323-04 Modernization with AT/FP plus Solar PV**

| Period | Depreciation Schedule | Residual Value |
|---------------|----------------------------------|---------------------------|
| 2012 | \$ - | \$ - |
| 2013 | \$ 4,252,514 | \$ - |
| 2014 | \$ 4,175,195 | \$ - |
| 2015 | \$ 4,097,877 | \$ - |
| 2016 | \$ 4,020,558 | \$ - |
| 2017 | \$ 3,943,240 | \$ - |
| 2018 | \$ 3,865,922 | \$ - |
| 2019 | \$ 3,788,603 | \$ - |
| 2020 | \$ 3,711,285 | \$ - |
| 2021 | \$ 3,633,966 | \$ - |
| 2022 | \$ 3,556,648 | \$ - |
| 2023 | \$ 3,479,329 | \$ - |
| 2024 | \$ 3,402,011 | \$ - |
| 2025 | \$ 3,324,693 | \$ - |
| 2026 | \$ 3,247,374 | \$ - |
| 2027 | \$ 3,170,056 | \$ - |
| 2028 | \$ 3,092,737 | \$ - |
| 2029 | \$ 3,015,419 | \$ - |
| 2030 | \$ 2,938,100 | \$ - |
| 2031 | \$ 2,860,782 | \$ - |
| 2032 | \$ 2,783,464 | \$ - |
| 2033 | \$ 2,706,145 | \$ - |
| 2034 | \$ 2,628,827 | \$ - |
| 2035 | \$ 2,551,508 | \$ - |
| 2036 | \$ 2,474,190 | \$ - |
| 2037 | \$ 2,396,871 | \$ - |
| 2038 | \$ 2,319,553 | \$ - |
| 2039 | \$ 2,242,235 | \$ - |
| 2040 | \$ 2,164,916 | \$ - |
| 2041 | \$ 2,087,598 | \$ - |
| 2042 | \$ 2,010,279 | \$ 2,010,279 |

NOTE:

Useful life of asset: 55.0 years

Source: BAE Urban Economics, Inc. 2012.

Table 17: Midwest Urban Consumer Price Index

| Year | Index (1982=100) | Annual CPI % Change |
|-------------|-----------------------------|--------------------------------|
| 1993 | 140.00 | 2.56% |
| 1994 | 144.00 | 2.86% |
| 1995 | 148.40 | 3.06% |
| 1996 | 153.00 | 3.10% |
| 1997 | 156.70 | 2.42% |
| 1998 | 159.30 | 1.66% |
| 1999 | 162.70 | 2.13% |
| 2000 | 168.30 | 3.44% |
| 2001 | 172.80 | 2.67% |
| 2002 | 174.90 | 1.22% |
| 2003 | 178.30 | 1.94% |
| 2004 | 182.60 | 2.41% |
| 2005 | 188.40 | 3.18% |
| 2006 | 193.00 | 2.44% |
| 2007 | 198.12 | 2.65% |
| 2008 | 205.38 | 3.66% |
| 2009 | 204.06 | -0.64% |
| 2010 | 208.05 | 1.95% |
| 2011 | 214.74 | 3.22% |
| 2012 | 219.10 | 2.03% |

Annual Average**20-years: 2.4%****LCCA Assumption: 0.0%**

Sources: U.S. Department of Labor, Bureau of Labor
Statistics; BAE Urban Economics, Inc. 2012.

Table 18: Discount Rates and Factors

| Year | Discount Factors | | | Calander Year |
|------|------------------|----------|-------------------|---------------|
| | End of Year | Mid-Year | Beginning of Year | |
| 1 | 0.9804 | 0.9901 | 1.0000 | 2012 |
| 2 | 0.9612 | 0.9707 | 0.9804 | 2013 |
| 3 | 0.9423 | 0.9517 | 0.9612 | 2014 |
| 4 | 0.9238 | 0.9330 | 0.9423 | 2015 |
| 5 | 0.9057 | 0.9147 | 0.9238 | 2016 |
| 6 | 0.8880 | 0.8968 | 0.9057 | 2017 |
| 7 | 0.8706 | 0.8792 | 0.8880 | 2018 |
| 8 | 0.8535 | 0.8620 | 0.8706 | 2019 |
| 9 | 0.8368 | 0.8451 | 0.8535 | 2020 |
| 10 | 0.8203 | 0.8285 | 0.8368 | 2021 |
| 11 | 0.8043 | 0.8123 | 0.8203 | 2022 |
| 12 | 0.7885 | 0.7963 | 0.8043 | 2023 |
| 13 | 0.7730 | 0.7807 | 0.7885 | 2024 |
| 14 | 0.7579 | 0.7654 | 0.7730 | 2025 |
| 15 | 0.7430 | 0.7504 | 0.7579 | 2026 |
| 16 | 0.7284 | 0.7357 | 0.7430 | 2027 |
| 17 | 0.7142 | 0.7213 | 0.7284 | 2028 |
| 18 | 0.7002 | 0.7071 | 0.7142 | 2029 |
| 19 | 0.6864 | 0.6933 | 0.7002 | 2030 |
| 20 | 0.6730 | 0.6797 | 0.6864 | 2031 |
| 21 | 0.6598 | 0.6663 | 0.6730 | 2032 |
| 22 | 0.6468 | 0.6533 | 0.6598 | 2033 |
| 23 | 0.6342 | 0.6405 | 0.6468 | 2034 |
| 24 | 0.6217 | 0.6279 | 0.6342 | 2035 |
| 25 | 0.6095 | 0.6156 | 0.6217 | 2036 |
| 26 | 0.5976 | 0.6035 | 0.6095 | 2037 |
| 27 | 0.5859 | 0.5917 | 0.5976 | 2038 |
| 28 | 0.5744 | 0.5801 | 0.5859 | 2039 |
| 29 | 0.5631 | 0.5687 | 0.5744 | 2040 |
| 30 | 0.5521 | 0.5576 | 0.5631 | 2041 |
| 31 | 0.5412 | 0.5466 | 0.5521 | 2042 |

Notes:

30-Year real discount rate 2.0%

Mid-year factor: 1.0100

Sources: Office of Management and Budget, OMB Circular A-94, Appendix C; BAE Urban Economics, 2012.